Orion-MCU™ User Manual

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1. About This Manual

This manual provides detailed guidance on the use of the Orion-MCU. It includes a description of the product, its functionality, features, configuration, and operation.

Feedback:

The SURF Technical Support Center is at your service. You may access Warranty Service through our Web Request Form by using the following link: www.orionmcu.com/support

We are committed to constant and perpetual improvement. Your input will greatly help us in our endeavor.

2. Introduction

2.1 Functionality

Orion-MCU provides SIP-based video/audio conferencing services for SMBs and enterprises. The product is a ready-to-use, stand-alone network appliance. The Orion-MCU's web-based management system offers easy system configuration, conference creation, monitoring and conference control in real time.

2.2 Main Capabilities

Orion-MCU offers the following capabilities:

- **SIP based:** Orion-MCU is a SIP-based conferencing system.
- **HD conferencing:** Orion offers wideband HD voice and HD video in resolutions of up to 720p.
- **Mixing:** A variety of conferencing devices are bridged by Orion's advanced audio/video mixing and adapting capabilities. Participants receive video and audio streams that are adapted to their device's media characteristics - codecs, rates, frame size and resolution.
- **Video/voice characteristics:**

  Voice codecs: G711a, G711u, G729, G722.1[1], iLBC, G723

  Video codecs: MPEG4, H263, H264

  Video resolution: Up to 720p
- **Conference Management:** Conferences can be managed by a leader, or set as automated ad-hoc conference rooms.

[1] This product includes ITU-T G.722.1 (Polycom(R) Siren7TM) technology.

- **Leader Dashboard:** The Orion-MCU "Leader Dashboard", enables conference leaders to manage the conference. Upon logging into the Leader Dashboard, the leader can invite participants, modify conference parameters (such as mute and dominant speaker), and revoke/disconnect participants from the conference and view conference information.
- **Multiple Access Numbers:** Orion-MCU supports multiple access numbers. The Orion-MCU's access numbers are pre-provisioned, and are dialed by conference participants directly or indirectly via their serving PBX.
- **Multiple Video Layout Options:** Equal-presence and dominant-based layouts are supported in the system. These layouts are modified automatically, when a participant enters or leaves the conference.
- **VIP Participants:** Orion-MCU allows VIP participants to join a conference without PIN code authentication.
- **Registration:** Orion-MCU is provisioned for registration as a SIP endpoint in the network. An authentication option is provisioned for each registration process. SIP clients may register to Orion-MCU's built-in SIP registrar.
- **NAT Traversal:** Orion-MCU provides near-end and far-end NAT traversal, enabling connectivity between entities (Orion-MCU / SIP clients) which are behind not-SIP-aware NATs and firewalls.
- **Content Sharing:** Orion-MCU provides content sharing, originated by a SIP client. In this case the conferencing layout is modified to one large image which contains the content (currently, content sharing works only with AVer room systems).

3. Topologies

This section describes the network topologies supported by Orion-MCU.

3.1 Topology 1 - Orion-MCU via SIP PBX

As shown below in Figure 3-1, the participants' connectivity with Orion-MCU is provided via the PBX that provides SIP registrar services to the users. In order to enhance existing services for multimedia conferencing, the PBX interacts with Orion-MCU using SIP.

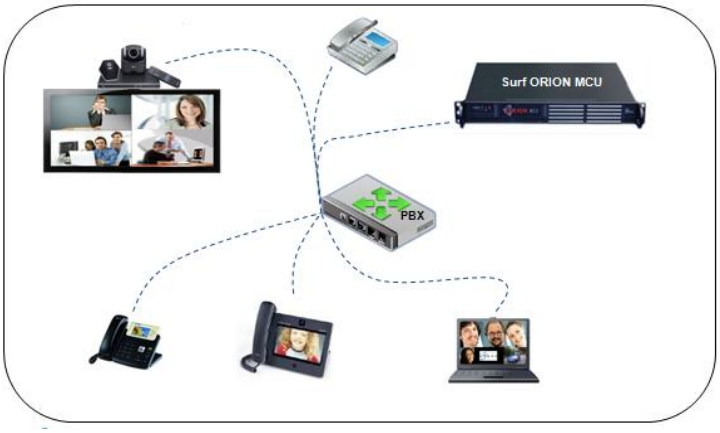


Figure 3-1: Topology 1 - Orion-MCU via SIP PBX

1. All SIP endpoints at the enterprise register with the PBX.
2. The PBX supports SIP Signaling
3. The Orion-MCU registers as an extension or is configured as a trunk in the PBX.
4. Orion-MCU provides Mixing/Bridging/Switching and signaling interoperability.
5. Voice-only clients can also participate in a video conference, making it a mixed Voice/Video conference.

3.2 Topology 2 - Orion-MCU via PBX and Direct Connectivity

As shown below in Figure 3-2, the participants join the conference either through Orion-MCU or the PBX.

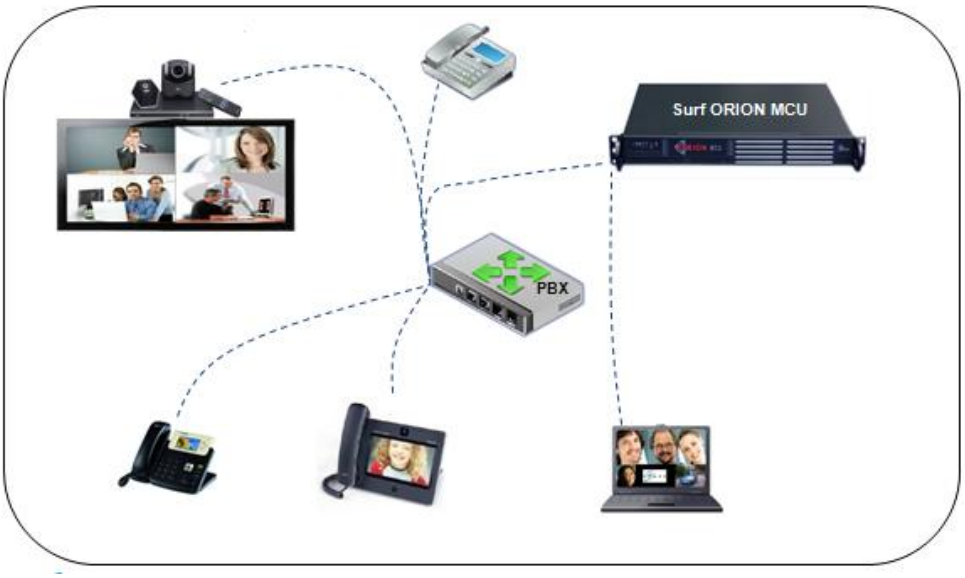


Figure 3-2: Topology 2 - Orion-MCU via PBX and Direct Connectivity

1. SIP endpoints are registered with the Orion-MCU internal SIP registrar or the PBX.
2. The PBX supports SIP Signaling
3. The Orion-MCU registers as an extension or is configured as a trunk in the PBX.
4. SIP endpoints can call through the PBX, Orion-MCU registrar or directly to the Orion-MCU
5. Orion-MCU provides Mixing/Bridging/Switching and signaling interoperability.
6. SIP endpoints can also connect directly using direct dialing (without registration)
7. Voice-only clients can also participate in a video conference, making it a mixed Voice/Video conference.

3.3 Topology 3 - Direct Interaction with Orion-MCU

As shown below in Figure 3-3, the participants interact directly with the Orion-MCU, via SIP, to connect to a conference room. The participants' PIN numbers and access codes are pre-provisioned through Orion's web-based management system.

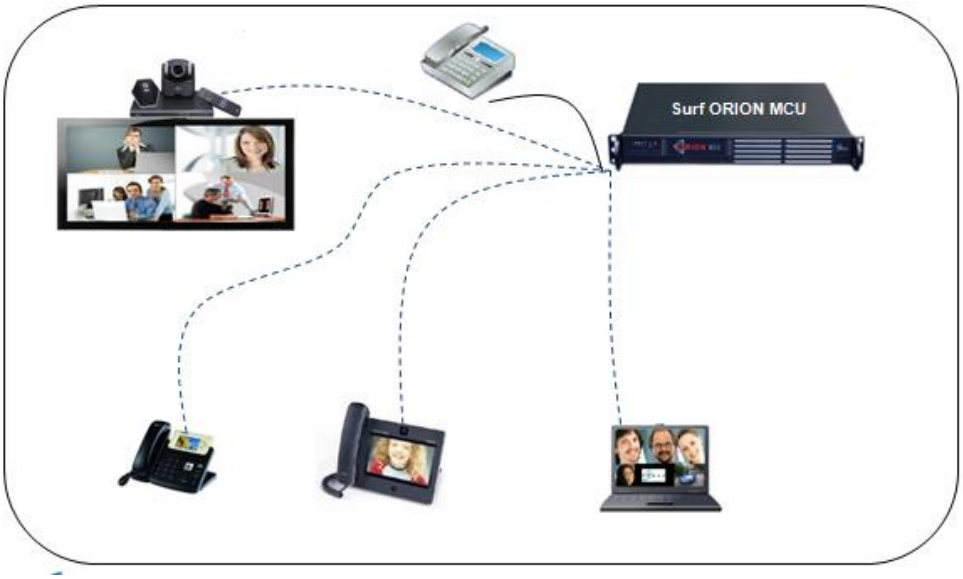


Figure 3-3: Topology 3 - Direct Interaction with Orion-MCU

1. Endpoints may be registered with the Orion-MCU SIP registrar.
2. SIP endpoints can call through the Orion-MCU registrar or directly to the Orion-MCU (without registration).
3. Orion-MCU provides Mixing/Bridging/Switching and signaling interoperability.
4. Voice-only endpoints can also participate in a video conference, making it a mixed Voice/Video conference.

3.4 Topology 4 - Connectivity with External Networks

As shown below in Figure 3-4, the connectivity between conference participants in an enterprise network and participants on public networks is provided through Orion-MCU.

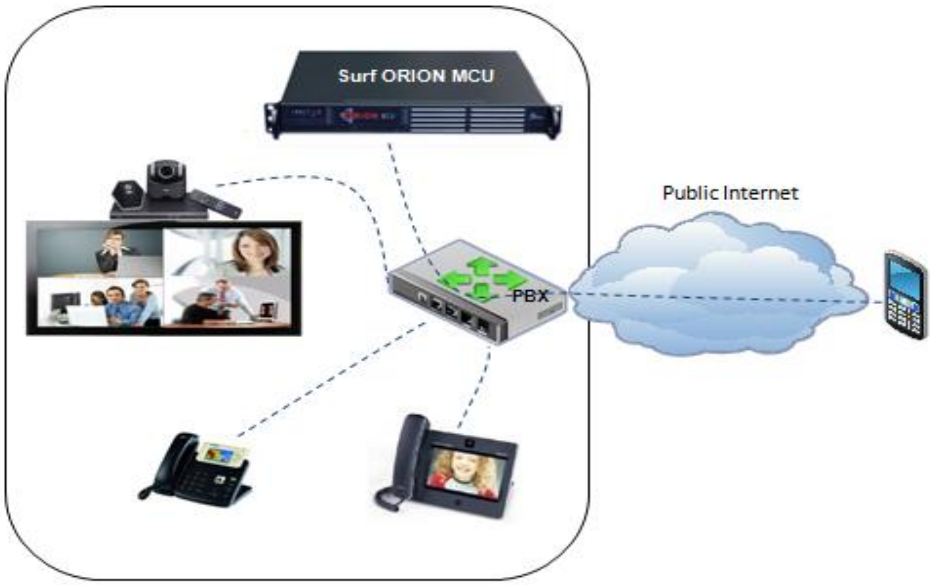


Figure 3-4: Topology 4 - Connectivity with External Networks

1. All SIP Endpoints register with the PBX.
2. The PBX supports SIP Signaling.
3. The Orion-MCU registers as an extension or is configured as a trunk in the PBX.
4. Endpoints can also connect via the external network.
5. Orion-MCU provides Mixing/Bridging/Switching and signaling interoperability.
6. Voice-only clients can also participate in a video conference, making it a mixed Voice/Video conference.

3.5 Topology 5 - NAT Traversal Capabilities with Orion-MCU

As shown below in Figure 3-5, Orion-MCU provides NAT Traversal capabilities. The system may be located in a DMZ, with a public or private IP address, or in a LAN with a private address. In the below topology the participants and Orion-MCU are located in two separate, remote LANs:

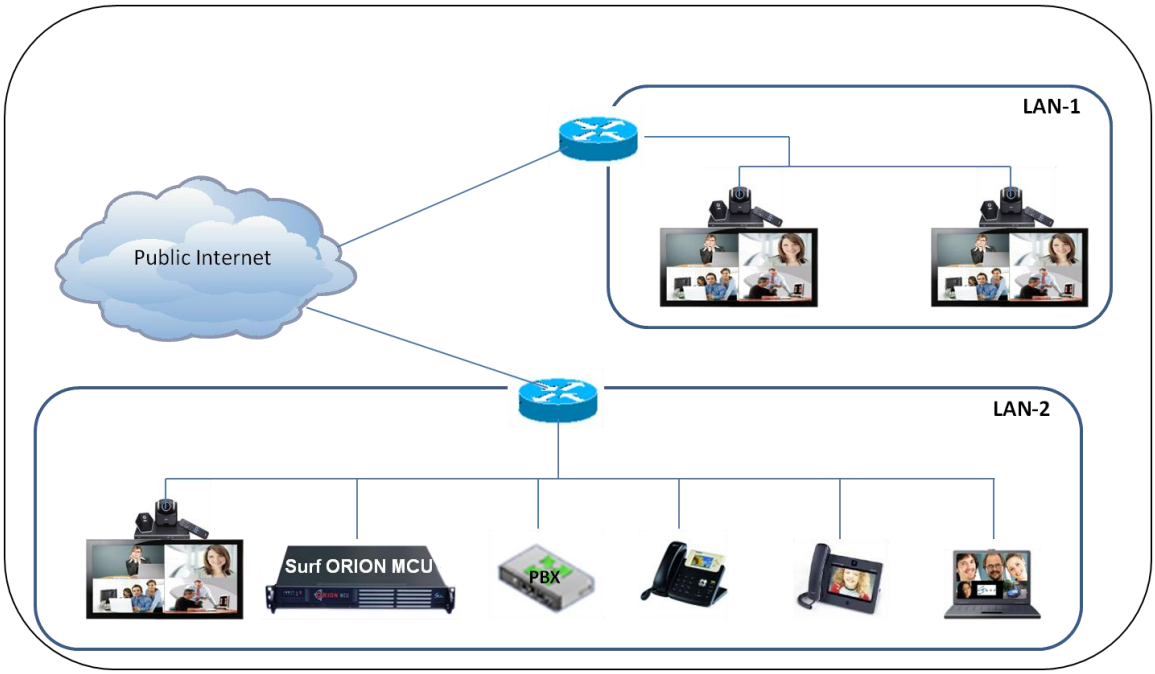


Figure 3-5: NAT Traversal Capabilities

1. Endpoints can register with the Orion-MCU SIP registrar or to the PBX
2. Remote office (LAN 1) can be connected to the Orion-MCU using built-in NAT Traversal capabilities.
3. Orion-MCU provides mixing/bridging/switching, signaling interoperability and NAT translation.
4. Voice-only endpoints can also participate in a video conference, making it a mixed voice/video conference

3.6 Topology 6 - Connectivity with Remote Endpoints

As shown below in Figure 3-6, Orion-MCU is located behind a NAT, with a private IP address. The participants interact directly with the Orion-MCU, via SIP, to set and initiate a conferencing session.

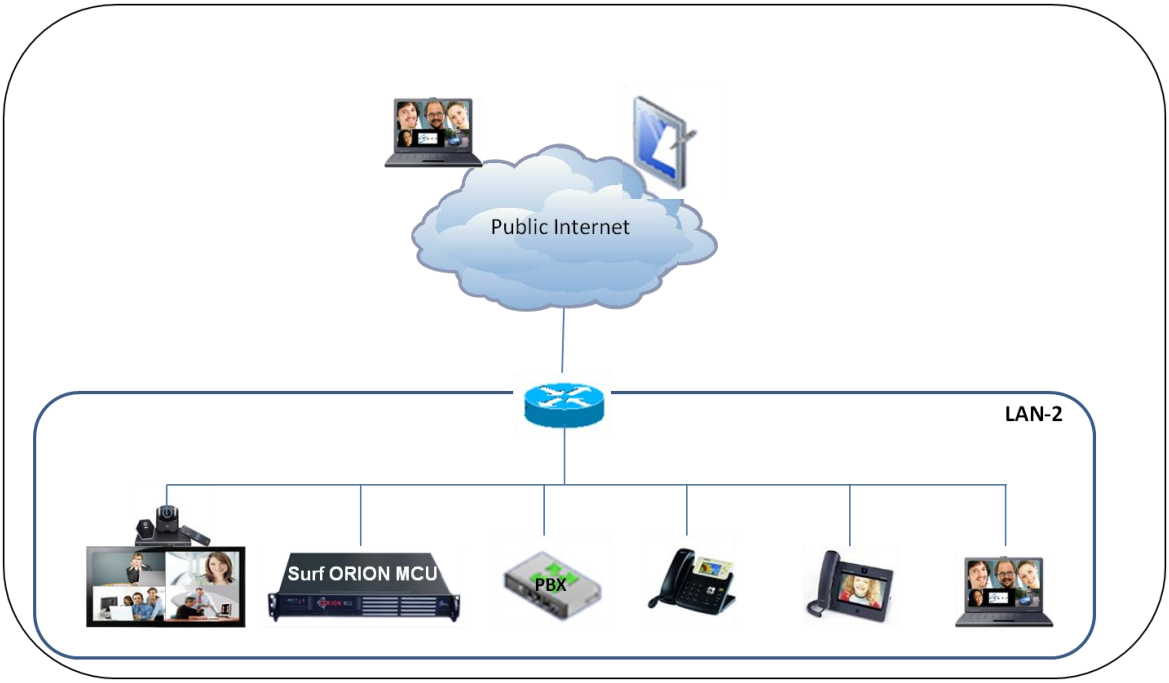


Figure 3-6: Connectivity with Remote Endpoints

1. All SIP Endpoints at the enterprise register to the PBX or the Orion-MCU
2. The LAN firewall / router must have port forwarding configured to the Orion-MCU
3. Remote employees connect to the conference call by registering with the Orion-MCU.
4. Orion-MCU provides mixing/bridging/switching, signaling interoperability and NAT translation.

4. Physical Overview

4.1 Description

The front view of the Orion-MCU is depicted in Figure 4-1 below.

Figure 4-1: Orion-MCU Front View

The Orion-MCU is available in 2 configurations, supporting both small and large enterprises:

Orion-MCU 1286 – Orion-MCU 1286 is a small-to-medium enterprise-based video/voice conferencing system. Concurrently the system supports up to 2 CIF conferences, or 1 VGA or HD conference, with up to 25 participants (between 5 to 12 are viewable, at each time, depending on the resolution). The system can also support up to 12 concurrent voice conferences.

Orion-MCU 4286 – Orion-MCU 4286 is a medium-to-large enterprise-based video/voice conferencing system. Concurrently the system supports up to 8 CIF conferences, or 4 VGA or HD conferences, with up to 25 participants (between 5 to 12 are viewable, at each time, depending on the resolution). The system can also support up to 20 concurrent voice conferences.

4.2 System Physical Interface

The system physical interface of Orion-MCU includes panel-based buttons, LEDs and I/O ports.

4.2.1 Buttons

There are two push buttons located on the front of the chassis: a reset button and a power on/off button.

Reset - The Reset button reboots the system.

Power - The Power button is used to turn on and turn off the system. Turning off the system eliminates the main power but maintains standby power. In order to service the system, the server should be shut down and the AC power cord should be

unplugged.

4.2.2 LEDs

The five control panel LEDs is located at the front of the chassis and provide information related to different system functions.

Overheat - When this LED is on, it indicates an overheat condition, which may be caused by an obstruction to the airflow or because the room temperature is too high. Check the airflow to the unit. This LED will remain on as long as the indicated condition exists.

NIC2 - Indicates network activity on LAN2 when flashing.

NIC1 - Indicates network activity on LAN1 when flashing.

HDD - Indicates hard drive activity when flashing.

Power - Indicates power is being supplied to the system. This LED is illuminated when the system is operating.

4.2.3 I/O Ports

Figure 4-2 shows a representation of the Orion-MCU I/O as they apper on the rear of the chassis.

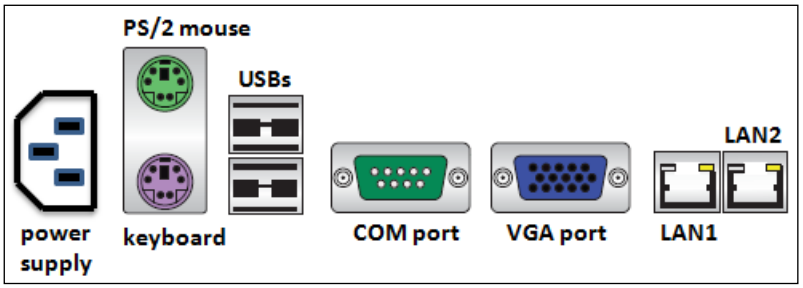


Figure 4-2: I/O Ports

5. Getting Started

Step 1: Follow the precautionary and safety instructions

Follow the precautionary and system safety instructions that appear in Appendix A of this User Manual. To install the system, choose a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. If you intend to install the system in a rack, choose a location near a grounded power outlet, and follow the instructions in Appendix B of this User Manual.

Step 2: Unpack your Orion-MCU system

Step 3: Connect the cables

Connect the cables to your Orion-MCU system:

1. Connect the short CAT-6 cable that is provided with the system in a loop as shown in Figure 5-1 below.
2. Connect the Orion-MCU "LAN" port to the Ethernet port of your computer using a CAT-5/6 cable.
3. Connect the power cable first to the Orion-MCU and then to the power outlet. Press the power-on button located on the front panel of the Orion-MCU to start the system. (Server and application load time is approximately 5 minutes).

Figure 5-1: Cable Connectivity

Step 4: Apply the static IP address "192.168.0.2" to your Computer

Change your computer's network settings and apply the following static IP address: "**192.168.0.2**".

Step 5: Change Orion-MCU's IP address

Orion-MCU is provided with a default IP address "**192.168.0.1**" that should be modified before using the system.

To change the IP address:

1 In a web browser, navigate to the default IP address - 192.168.0.1. Upon the appearance of the login screen, enter the default user name and password (admin, admin).

Note: *Orion-MCU web based GUI supports Internet Explorer 8 or newer, Google Chrome 20 or newer, Mozilla Firefox 14 or newer and Safari 5 or newer.*

2. Select **System Settings > Network Settings,** as shown in Figure 5-2 below:

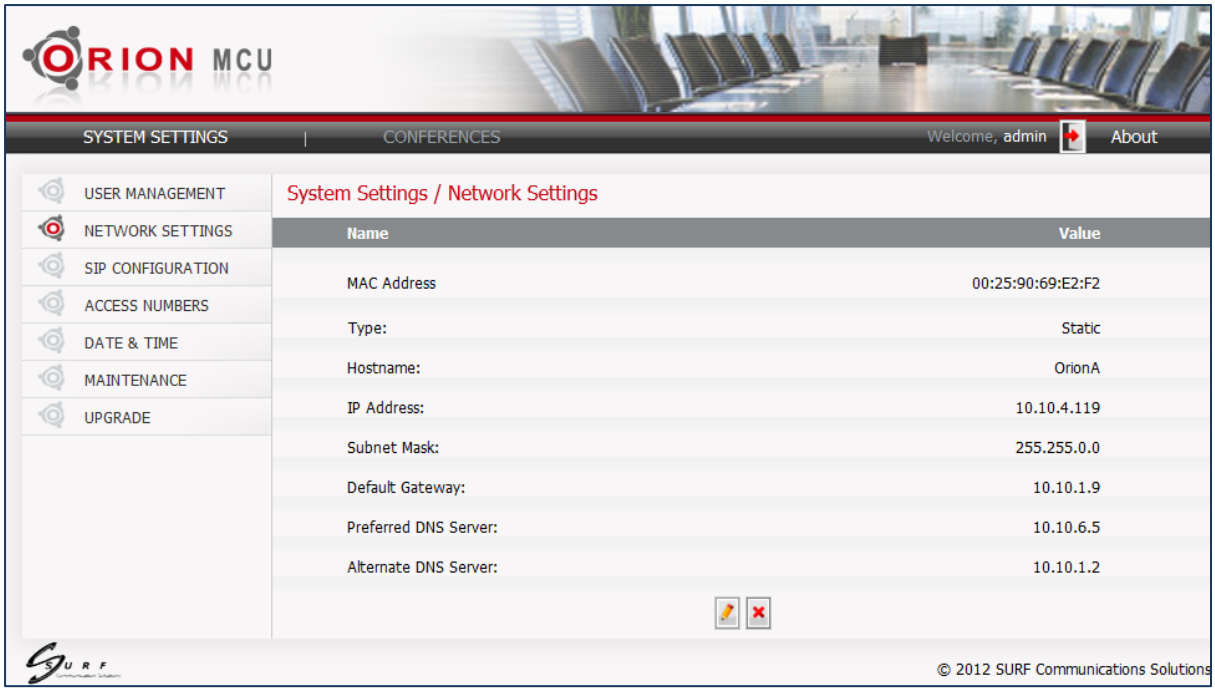


Figure 5-2: Network Settings Window

4. Click Edit and then modify the IP Address field.
5. Click Save . A confirmation message appears, as shown in Figure 5-3 below:

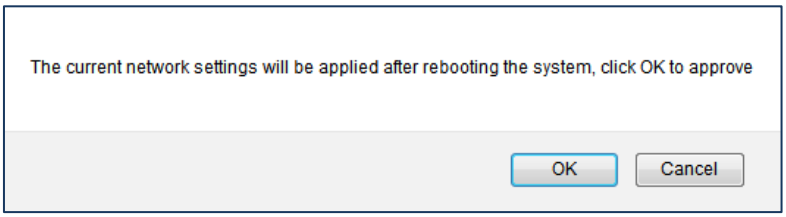


Figure 5-3 - Network settings confirmation message

6. Click **OK**.

   The system reboots and the changes are applied.

Note: *If **DHCP** was chosen, the simplest way to see the Orion-MCU IP Address is to connect a monitor and restart the machine. The IP Address will appear in the Login Screen at the end of the system load.*

Step 6: Connect to the Orion-MCU IP Address from your Network

Restore the original network configuration on your computer, and connect the Orion-MCU to your network.

Connect to Orion-MCU management system by entering the Orion-MCU's IP address in a web browser.

The Orion-MCU is now connected to your network

6. Administration and Configuration

6.1 Overview

The administration and configuration of the Orion-MCU are performed using the web-based management system.

After setting up the system – and prior to conference-service creation – the system should be configured according to the steps described in this section.

6.2 Login

After entering the Orion-MCU's IP address in your web browser, the **Login** window appears. Enter the default user name and password (**admin, admin**).

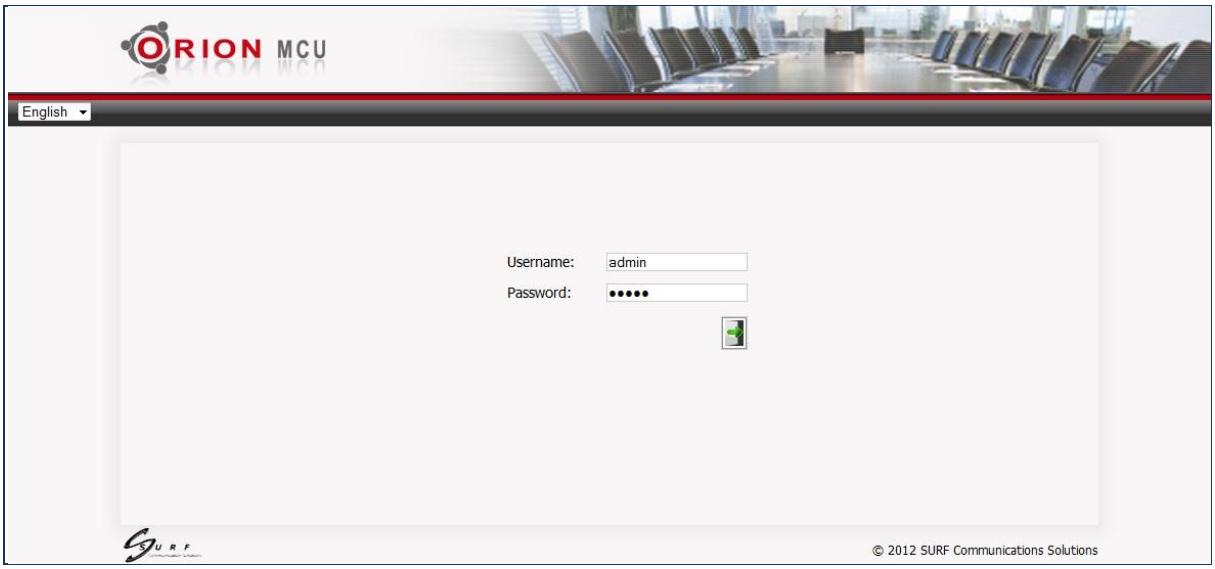


Figure 6-1: Login Window

***Note**: It is recommended to change the default admin password, before starting to use the system.*

***Note:** The user can choose a language from the system's pre-defined list of languages by using the drop down menu on the top-left side of the screen.*

6.3 Main Menu

The **Main Menu** window appears when the user has logged in. This window is divided into two main categories:

a) System Settings

b) Conferences

Prior to conference creation, system settings must be configured.

Figure 6-2: Main Menu Window

***Note**: To log out, click the logout icon (red), at the top-right of the screen*

***Note:** To view Orion-MCU component versions, click **About**, at the top-right of the screen.*

6.4 User Management

The **User Management** window allows the administrator to create a new user, update existing user information, or remove a user from the system.

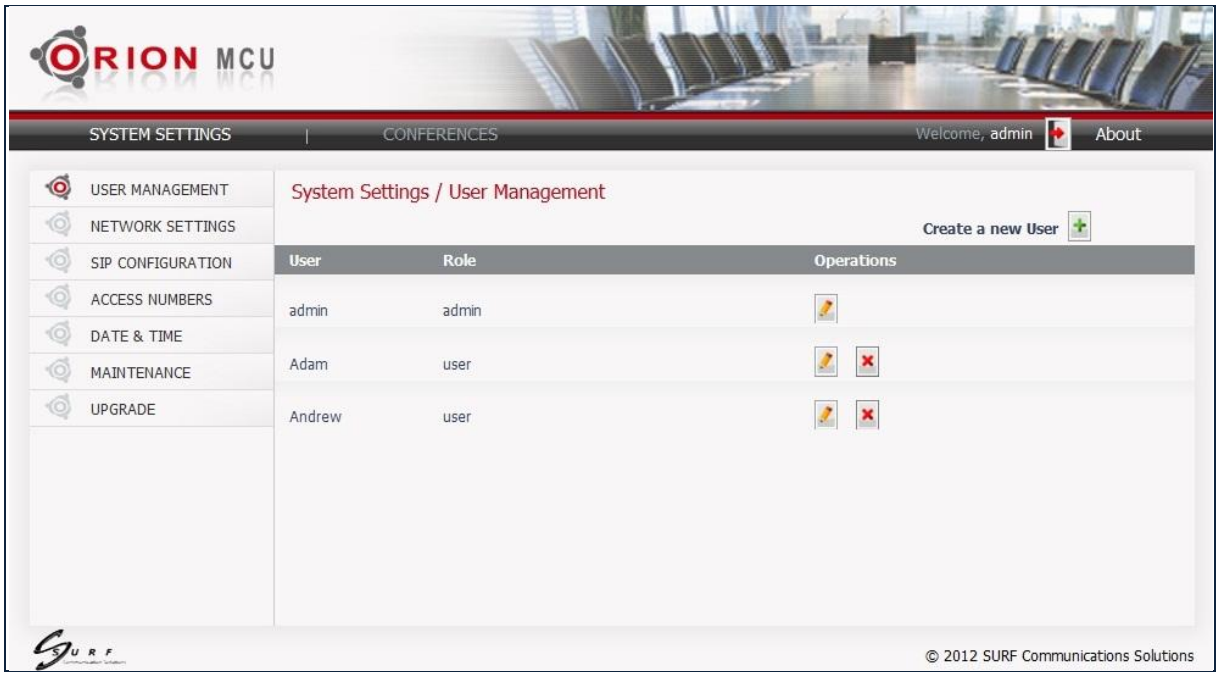


Figure 6-3: User Management Window

The **User** field lists user names. The **Role** field displays the capabilities of the user in the system. The Role can be either **admin** or **user:**

- The **admin** role permits access to all system capabilities.
- The **user** role enables only conference creation, viewing, and modification of conference information.

6.4.1 Creating a New User

To create a new user:

1. In the **System Settings > User Management** window, click on **Create a new User** button. The **Create a new User** window opens:

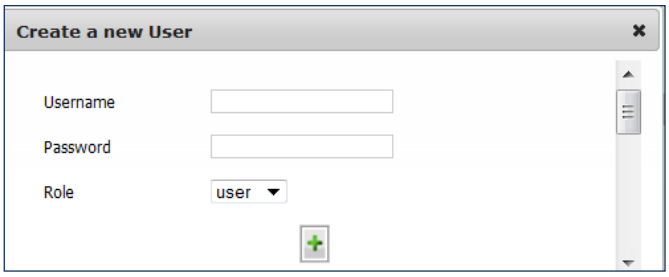


Figure 6-4: Create a New User Window

2. Enter a **Username** and a **Password**.
3. Select a **Role** for the user.
4. Click to add the new user to the system.

6.4.2 Modifying User Information

To modify user information:

1. In the **System Settings > User Management** window, click Edit in the **Operations** column of the user to be edited.

   The Edit User window opens.

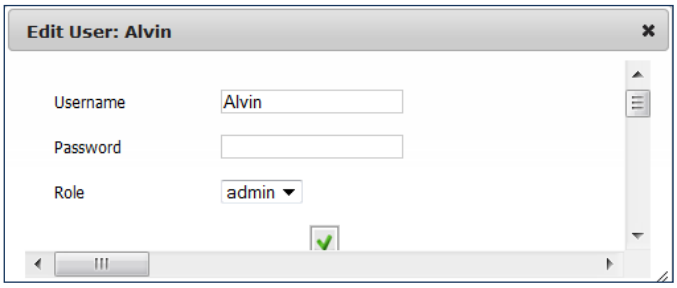


Figure 6-5: Edit User Window

2. Modify the information as needed and click **Save** .

6.4.3 Deleting a User

To delete a user from the system:

- In the System Settings/User Management window, click **Delete** in the **Operations** column of the user to be removed.

6.5 System Parameter Settings

Before creating a conference, the network and SIP parameters must be provisioned.

6.5.1 Configuring Network Settings

Network settings are configured in the **Network Settings** window, as shown in Figure 6-6 below.

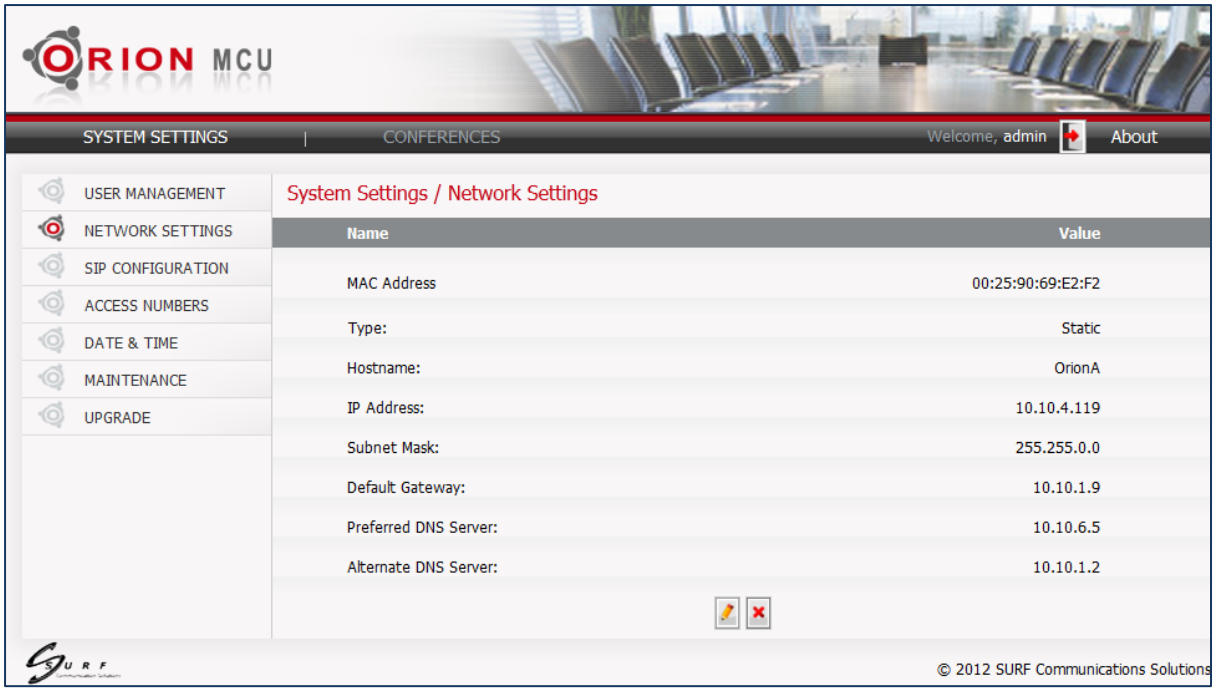


Figure 6-6: Network Settings Window

To configure network settings:

1. Select **System Settings > Network Settings**.
2. Click **Edit** . Network parameters become editable.

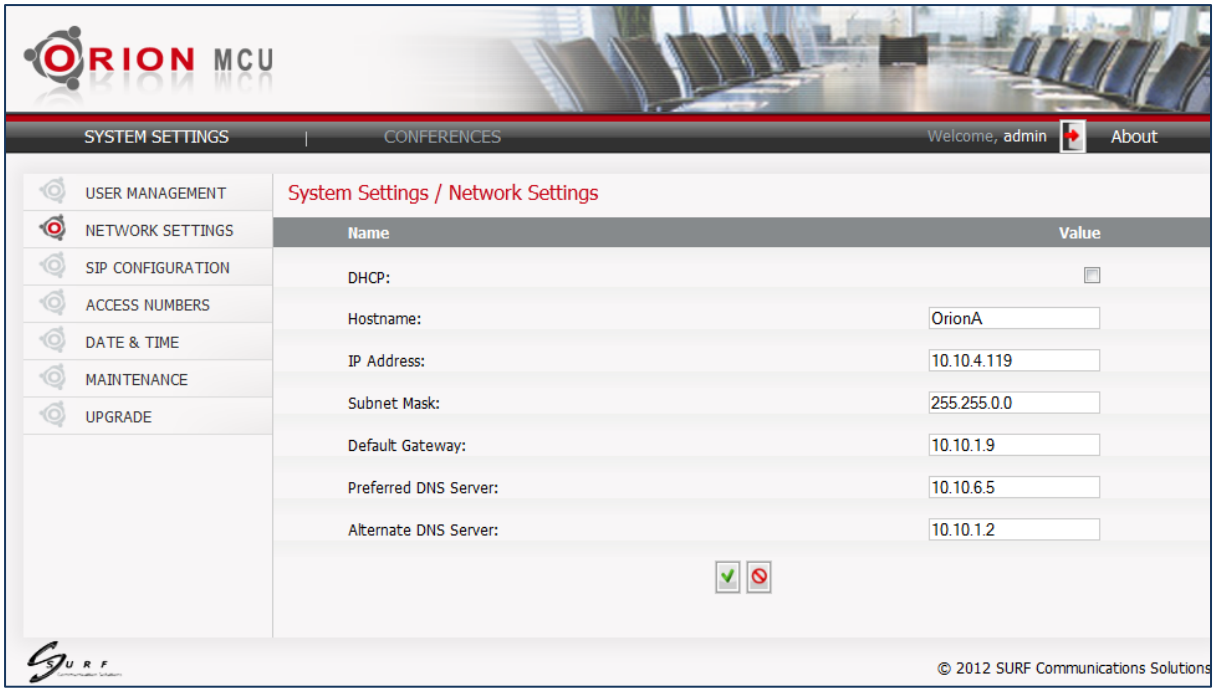


Figure 6-7: Network Settings Editing

***Note**: If the **DHCP** parameter is selected, then only the Hostname parameter can be edited. All other network parameters are grayed out.*

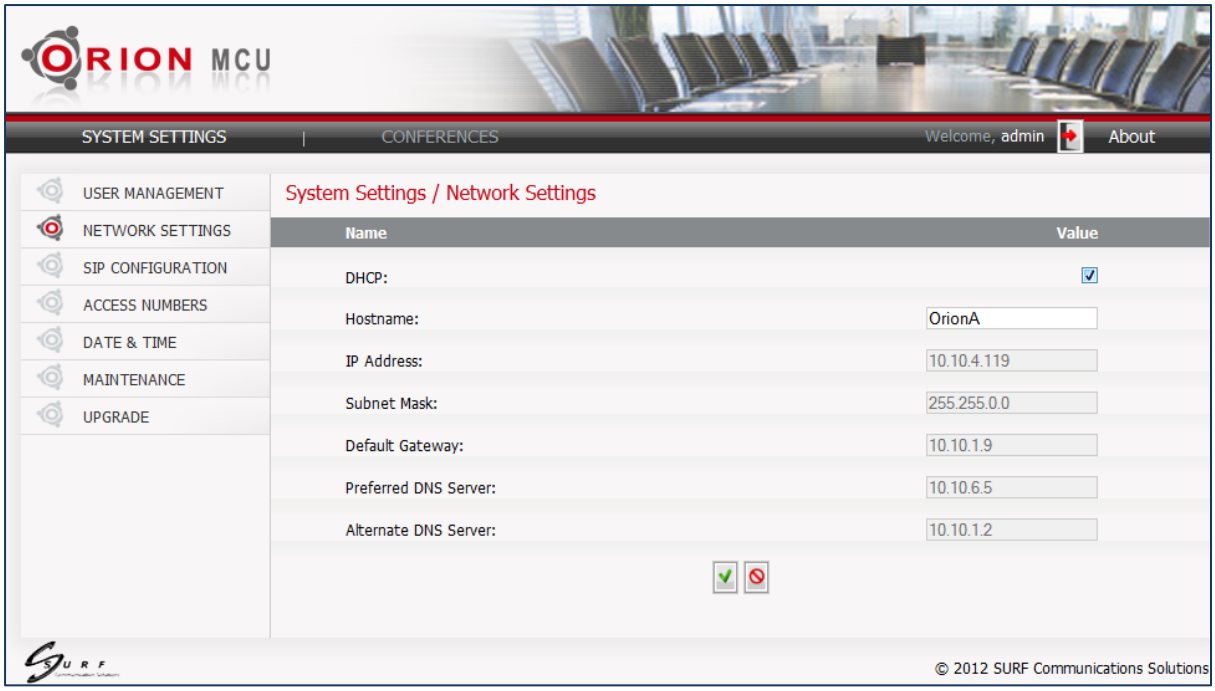


Figure 6-8: Network Setting Window

3. Edit the network parameters, as needed, according to the following table:

Parameter	Definition	Description
Hostname	String	The name of the Orion-MCU system in your network. It's highly important to configure the **Hostname** as defined in the DNS of the LAN or the WAN where the Orion-MCU is deployed. Orion-MCU is using the hostname value in SIP calls with emphsis on NAT Traversal scenarios. Example: orion1.orionmcu.com
IP Address	IP address	The Orion-MCU system's IP Address
Subnet Mask	Net-mask	The Orion-MCU system's subnet mask
Default Gateway	IP address	The IP Address of the default gateway
Preferred DNS Server	IP address	The IP Address of the preferred DNS Server
Alternate DNS Server	IP address	The IP Address of the alternate DNS Server

Table 6-1: Network Parameters

Note: *DNS definition is highly important for system upgrades and SIP calls with domain names involved.*

4. To revert to the previous values, click **Revert**.
5. Click **Save** to save the configuration.

   A message appears, requesting confirmation to restart the system. The changes are applied upon restarting the system.

6.5.2 SIP Configuration

SIP parameters are configured in the **SIP Configuration** window, as shown in Figure 6-9 below.

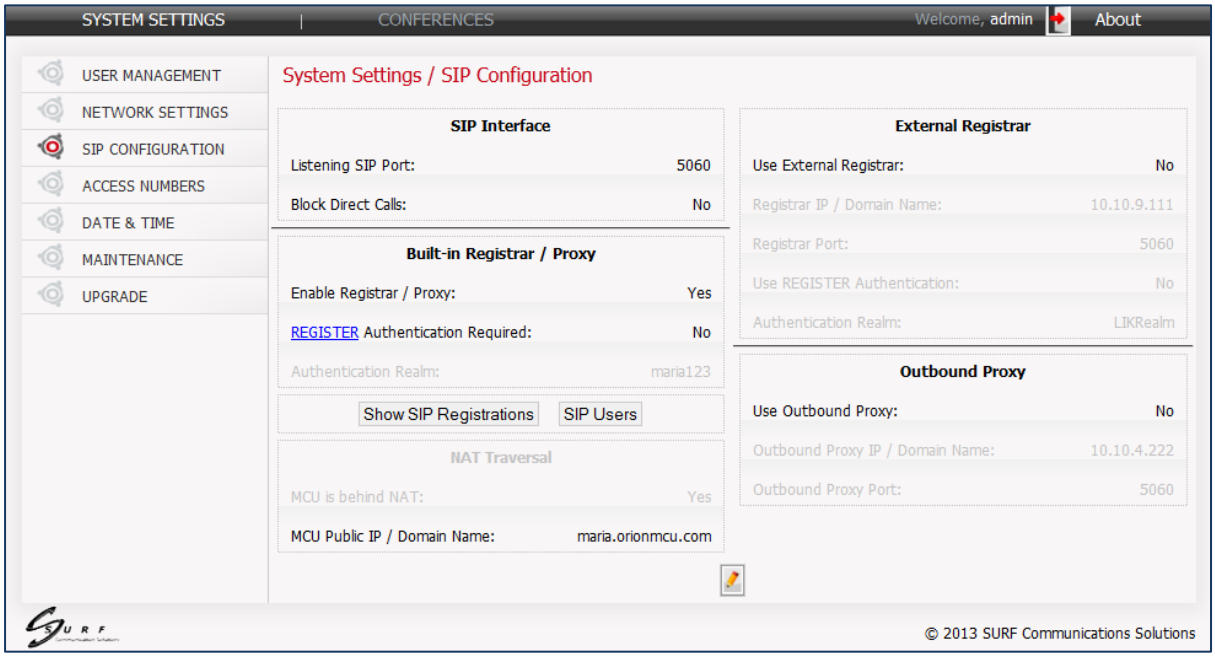


Figure 6-9: SIP Configuration

To configure SIP Settings:

1. Select **System Settings > SIP Configuration**.
2. Click **Edit** . The SIP settings become editable.

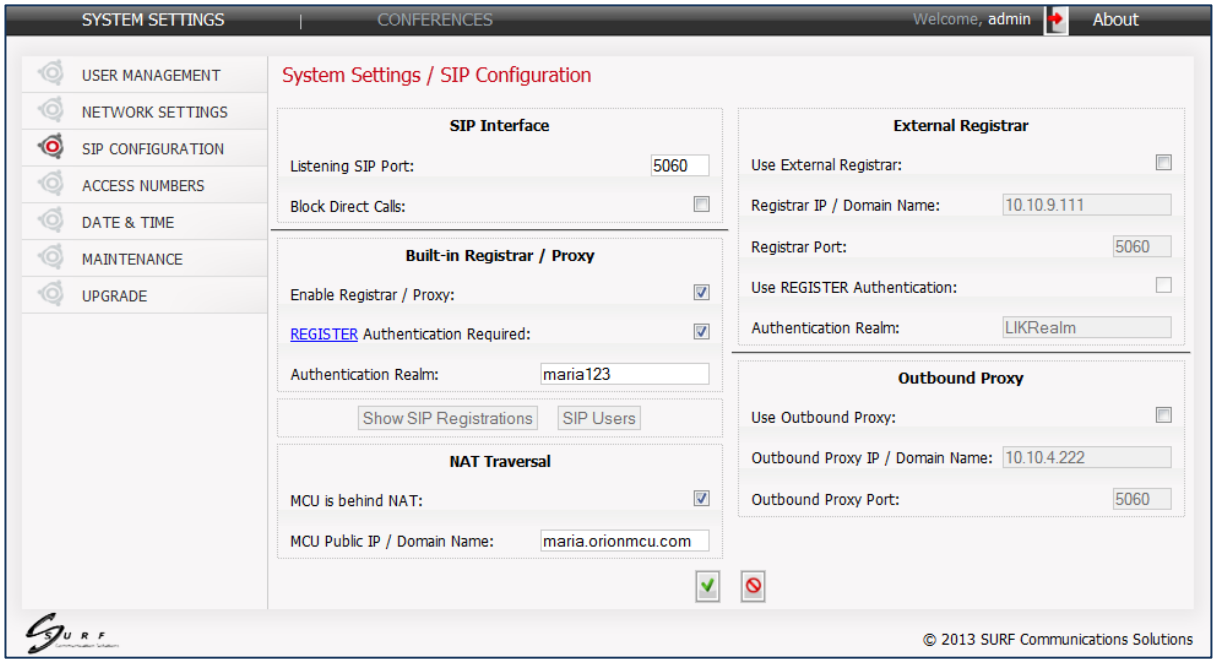


Figure 6-10: SIP Parameters Editing

3. Edit the SIP parameters. The SIP parameters are described in the following tables:

SIP Interface

Parameter	Values	Description
Listening SIP Port	Port	This is Orion-MCU's built-in listening SIP port, used for registration of SIP clients, session establishments and interactions with SIP external entities.
Block Direct Calls	Check-box (Yes/No)	If this box is checked, the unregistered users will be blocked from dialing directly to the Orion-MCU.

Table 6-2: SIP Interface Settings

Built-in Registrar / Proxy

Parameter	Values	Description
Enable Registrar / Proxy	Check-box (Yes/No)	If this box is checked then Orion-MCU can be used as a registrar for SIP clients.
REGISTER Authenticate Required	Check-box (Yes/No)	"REGISTER Authenticate Required" is a check box that determines the authentication of the managed users to Orion-MCU. Managed users are users that are provisioned in the system. If the box is checked, non-managed users are *not* allowed to register with the system
Authentication Realm	String	Authentication realm of Orion-MCU built-in Registrar for REGSITER digest challenge, any string can be used.
SIP Users		Used to view and manage the SIP users in the system. This function is applicable only when Built-in Registrar / Proxy is enabled. For more details, please refer to "SIP Users", section 6.5.2.1 below.
Show SIP Registrations		Used to display the system's registered users. This function is applicable only when Built-in Registrar / Proxy is enabled. For more details, please refer to "Show Users", section 6.5.2.2 below below.
NAT Traversal		
MCU is behind NAT	Check-box (Yes/No)	States whether the MCU is behind a NAT.
MCU Public IP / Domain Name	IP address	SIP public IP address or domain name, used for near-end NAT traversal (see section 9.4.1 below). NAT Traversal is not applicable for sessions which use **SIP Interface: SIP Listening Port** (see Table 6-2 above).

Table 6-3: Built-in Registrar Settings

External Registrar

Parameter	Values	Description
Use External Registrar	Check-box (Yes/No)	If an external registrar is configured, Orion-MCU registers access numbers and conference rooms to the external registrar.
Registrar IP/ Domain Name	IP address	The external registrar IP address or domain name
Registrar Port	Port	The external registrar SIP port
Use REGISTER	Check-box	Indicates whether the registration requires authentication.

Authentication	(Yes/No)	
Authentication Realm	String	The Authentication realm of the External Registrar Must be the value sent in 401 response to REGISTER messages (Authentication is supported for REGISTER only).

Table 6-4: External Registrar Settings

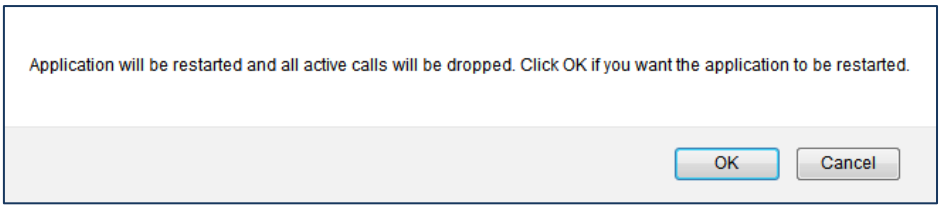
Outbound Proxy

Parameter	Values	Description
Use Outbound Proxy Server	Check-box (Yes/No)	States whether an outbound proxy server is used. In case that the Orion-MCU is behind NAT or configured with public IP, and NAT traversal (Near or Far end) is provided by Orion-MCU, the Outbound proxy server **should not** be configured.
Outbound Proxy Server IP	IP address	The Outbound proxy server IP address.
Outbound Proxy Server Port	Port	The Outbound proxy server port

Table 6-5: Outbound Proxy Settings

4. To revert to the previous values, click Cancel .
5. Click **Save** to save the configuration.

   If any SIP parameter has been modified, then all the active calls will be dropped and the application will restart. In this case the user's confirmation is required:



6. Click **OK**.

   The application restarts, and the new configuration is applied.

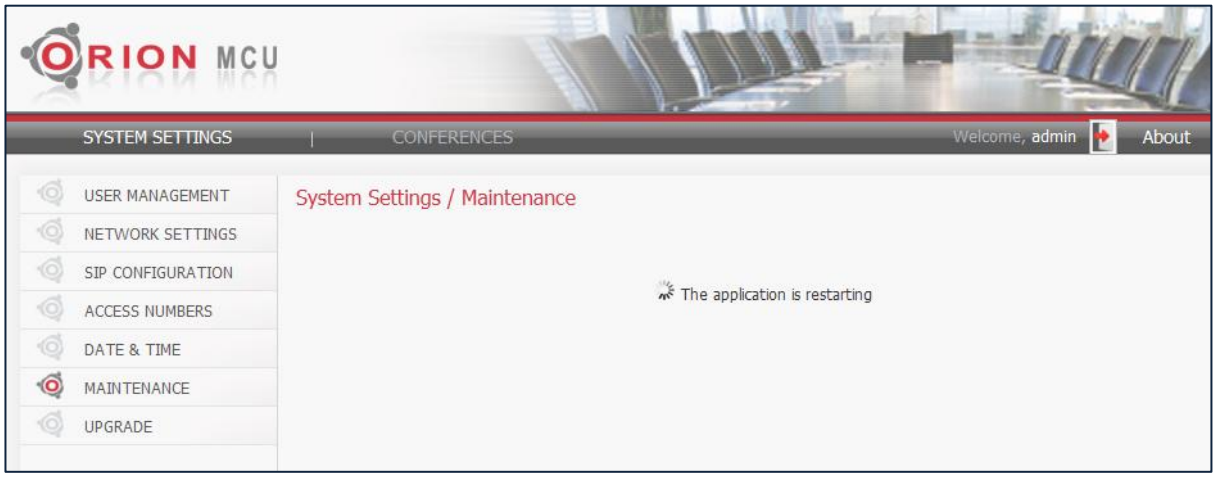


Figure 6-11: Restart After SIP Settings

6.5.2.1 SIP Users

You can view and manage the Orion-MCU's SIP users, by clicking on **SIP Users** button. This button is applicable, if Built-in Registrar / Proxy is enabled.

If these parameters are not enabled, enable them and click on **Save** , before moving forward. The system shall restart and the changes shall be applied.

To view the users:

- Click the **SIP Users** button. The following window is displayed:

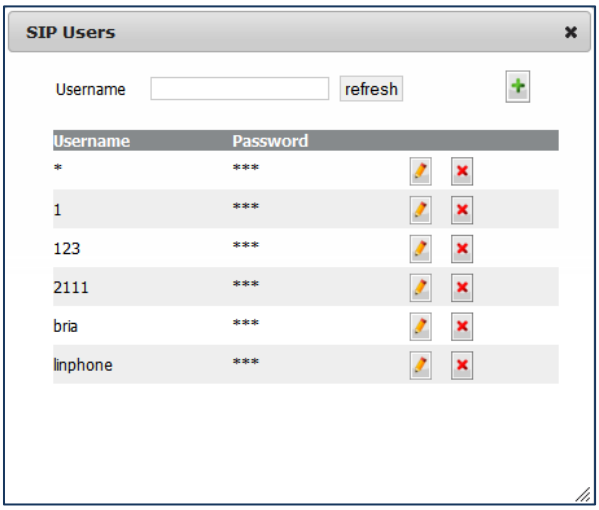


Figure 6-12: SIP Users Window

The columns on this screen can be sorted in ascending or descending order by clicking on any of the column headers.

To filter the displayed list

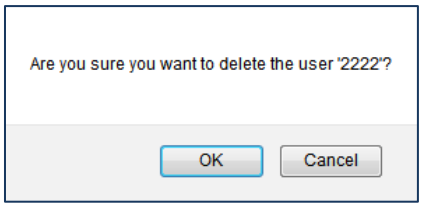
The user is enabled to filter the displayed list, using the toolbar at the top of the table:

The full **Username** or a partial string from it, provides the filtering criteria.

Pressing on **Refresh** resets the filter and the original list re-appears on the screen.

To delete a SIP user:

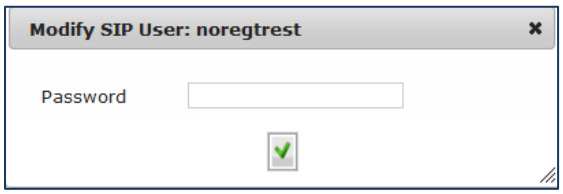
To delete a user click on . A dialog-box pop-up for user's confirmation.



To modify a SIP user:

To modify a user's **password:**

1. Click on the following window opens:



2. Enter the new password.
3. Click on the **Save** button.

To add a new SIP user:

1. Click on button, the following window appears:

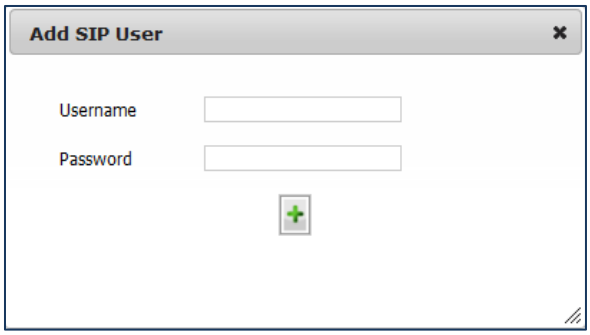


Figure 6-13: Adding SIP User

2. Enter the **Username** and the **Password** of the SIP User
3. Click on to confirm the action.

   A new user has been added to the system.

6.5.2.2 Show SIP Registrations

You can view the Orion-MCU's registered SIP users.

To view the registered users:

- Click the **Show SIP Registrations** button. The following window is displayed:

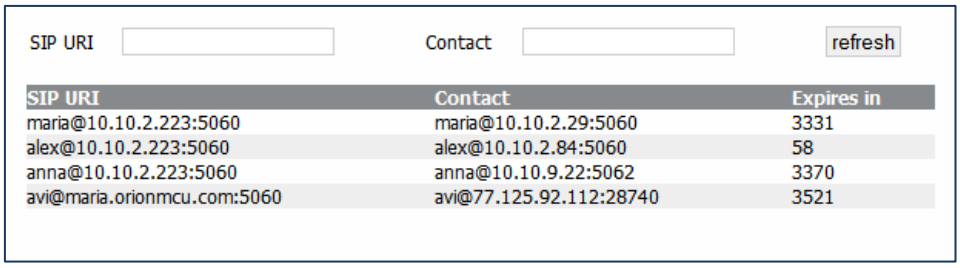


Figure 6-14: Show SIP Registrations Window

The columns on this screen can be sorted in ascending or descending order by clicking on any of the column headers.

Filtering the Displayed List

The user is enabled to filter the displayed list, using the toolbar at the top of the table:

Filtering criterias are as follows:

- **SIP URI.** Type a full **SIP URI** or a partial string of it.
- **Contact.** Type a full **Contact** or a partial string of it.

Pressing on **Refresh** resets the filter and the original list re-appears on the screen.

6.5.3 Configuring Access Numbers

An access number is a number which a participant dials to connect with the Orion-MCU. An IVVR directs the user to enter the conference number and the PIN code. However, access numbers are not mandatory, since a participant can also join a conference by dialing directly the conference number.

A single Orion-MCU supports multiple access numbers. The access numbers are provisioned via the Orion-MCU GUI, as shown in this section. If the number dialed by a participant does not match any of the provisioned access numbers (or conference numbers), the call is declined.

To configure access numbers:

1. Select **System Settings > Access Numbers**. The Access Numbers window opens:

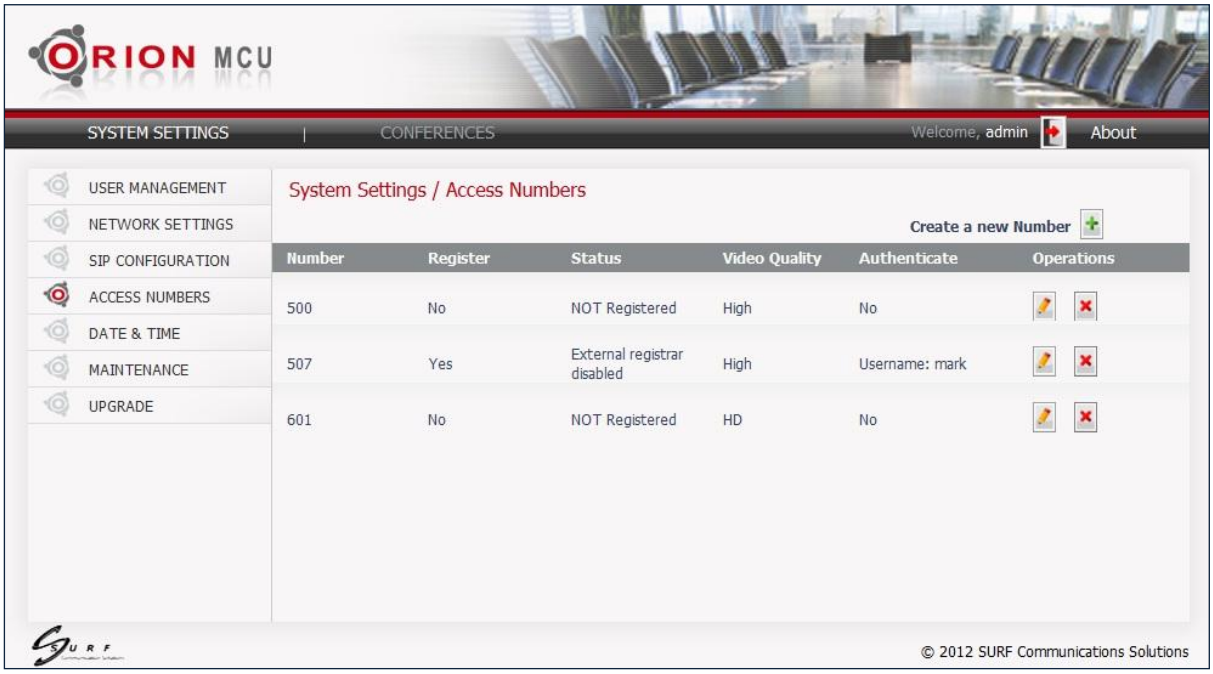


Figure 6-15: Access Numbers Provisioning

2. Click **Create** , for a new Number.

   The **Create a new Number** window opens.

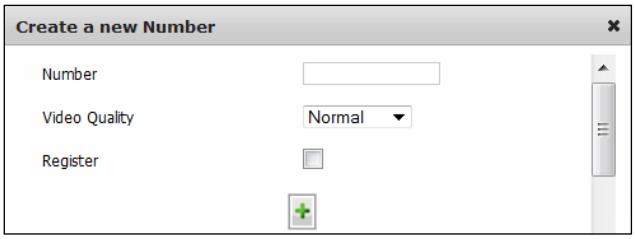


Figure 6-16: Create a New Number Window

3. In the **Number** field, type the new access number.
4. In the **Video Quality** field, select one of the following:
   - Voice Only
   - Normal: CIF (352X288)
   - High: VGA (640x480)
   - HD (1280x720)

5. Do one of the following:
   - To register the access number, continue with the next step.
   - To complete the configuration procedure, click **Save** .
6. To register the access number to the registrar, select **Register**.

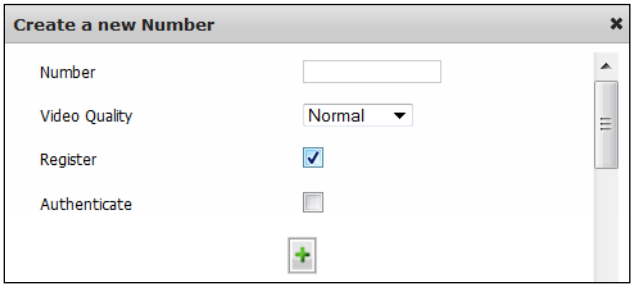


Figure 6-17: Registering a Number

The **Authenticate** option appears.

7. To authenticate the registration, select **Authenticate**.

   The **Username** and **Password** options appear.

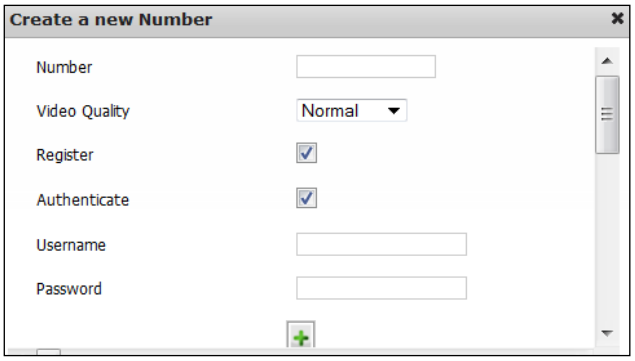
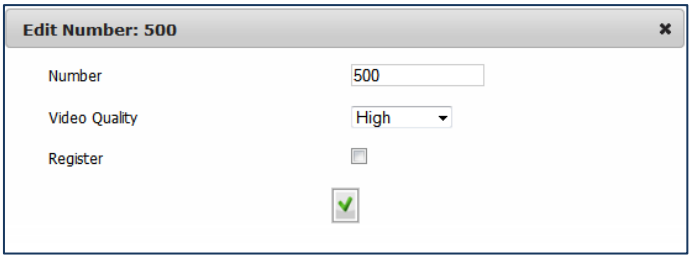


Figure 6-18: Authenticating a Number

8. Enter a **Username** and **Password**.
9. Click **Save** to save the configuration.

To edit the parameters of an existing access number:

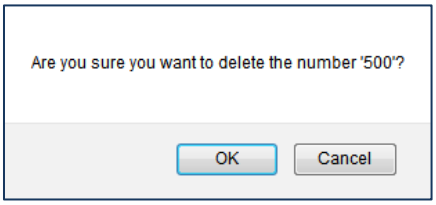
1. In the **Access Numbers** window, click in the **Operations** column of the number to be edited. The **Edit Access Number** window opens.



2. Modify the settings as needed and click **Save**.

To delete an access number from the list:

- In the **Access Numbers** window, click in the **Operations** column of the number to be deleted.



6.5.4 Date and Time

The date, time and time zone can be set manually, or an NTP server can be used to correct manual settings.

To set the date and time:

1. Select **System Settings > Date & Time**.

   The **Date & Time** window opens.

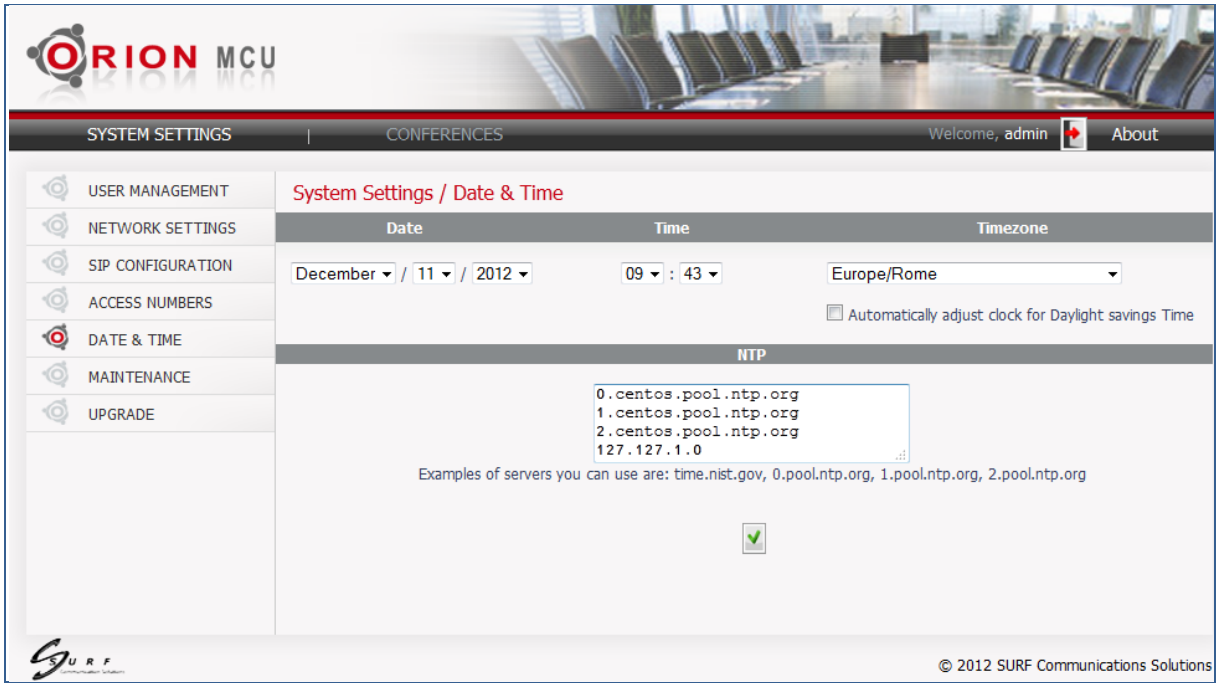


Figure 6-19: Date and Time Screen

2. Select the current **Date**.
3. Select the current **Time**.
4. Select the relevant **Timezone**.
5. To automatically adjust the time for daylight savings time, select **Automatically adjust clock for daylight savings time**.
6. To have an NTP server sync the Orion-MCU with other devices on the network, select a server from the **NTP** list.
7. To add a new server, enter a new line to the server's list.
8. To delete an existing server, remove the line from the list.

   If more than one NTP server appears in the list, the first server in the list has the highest priority.
9. Click **Save** .

6.6 Maintenance

The following maintenance actions can be performed:

- **View System Status** - Provides the status of system components, and general system information including CPU usage, free, and total memory.
- **Restart the Application** - The software application restarts and all ongoing sessions are dropped.
- **Hardware Reset** – Reboots hardware. This process is a longer process, taking around 3 minutes. It is recommended to log out and re-log into the system after a Hardware Reset.

- **Orion-MCU Shutdown –** Enables graceful system shut-down. When shut-down, the server will completely power off
- **Start Diagnostic Trace –** System events are collected during a specified interval and saved, creating a trace file for advanced diagnostics. For more information, please refer to section 6.6.1 below.

To perform system maintenance:

1. Select **System Settings > Maintenance**. The Maintenance window opens.

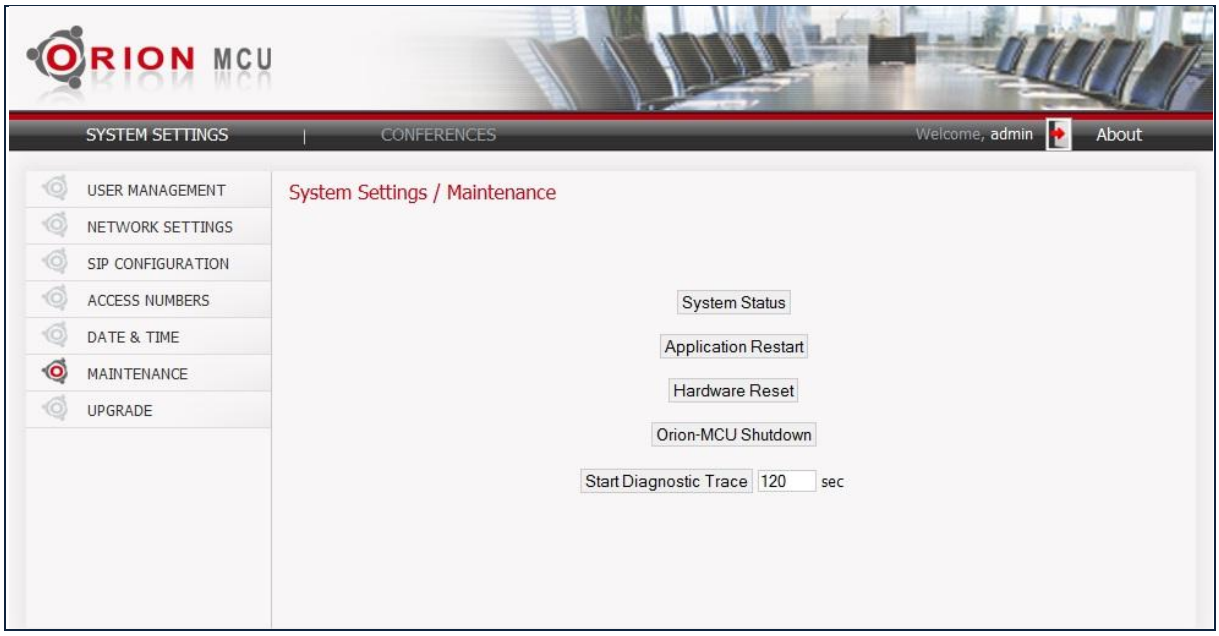


Figure 6-20: Maintenance Window

2. Click a button to perform the action specified.

For additional maintenance operations and troubleshooting, an emergency menu can be accessed using serial connectivity. For further information, see chapter10, Serial Connectivity.

6.6.1 Start Diagnostic Trace

To provide diagnostic trace to Surf support stuff:

1. Select **System Settings > Maintenance**. The Maintenance window opens.
2. Click on **Start Diagnostic Trace**
3. Enter the interval for information collection in the text-box. The allowed range is between “0” to “300” seconds.

The system creates a package with the system configuration, log files in debug level and IP trace of all the system network interfaces for the duration of the diagnostic trace, If “0” is entered, the system will create a package with system configuratiuon and logs only.

4. A diagnostic file (zip file) is created. Click **Save Diagnostic Trace** to save the file.

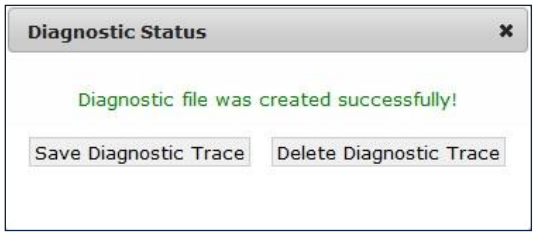


Figure 6-21: Diagnostic Dialog Box

5. After saving the file, **Delete Diagnostic Trace**, appears on the main **Maintenance** screen, allowing the user to delete the file.

   Only one trace file is allowed. To provide a new trace file, the existing file must be deleted.

6.7 Upgrade

The system shall be upgraded as software upgrade becomes available.

To upgrade the system:

1. Select **System Settings > Upgrade**. The Upgrade window opens:

Figure 6-22: Upgrade Window

2. In the **URL** text-box, type the Orion-MCU's upgrade server's address: update.orionmcu.com**.** If **DNS** has not been set (**Network Settings** section 6.5.1, use its IP address: **23.23.229.203**.
3. In **Version** text-box, enter the version number to be downloaded (will be supplied by Surf support, upon the release of a GA version).
4. After the upgrade is completed, the system must reboot. For an automatic reboot, select **Reboot**. Otherwise, after the upgrade's completion, the system shall reboot manually.
5. Click **Download**.

   After the software download is completed, the **Start the Upgrade** button is displayed:

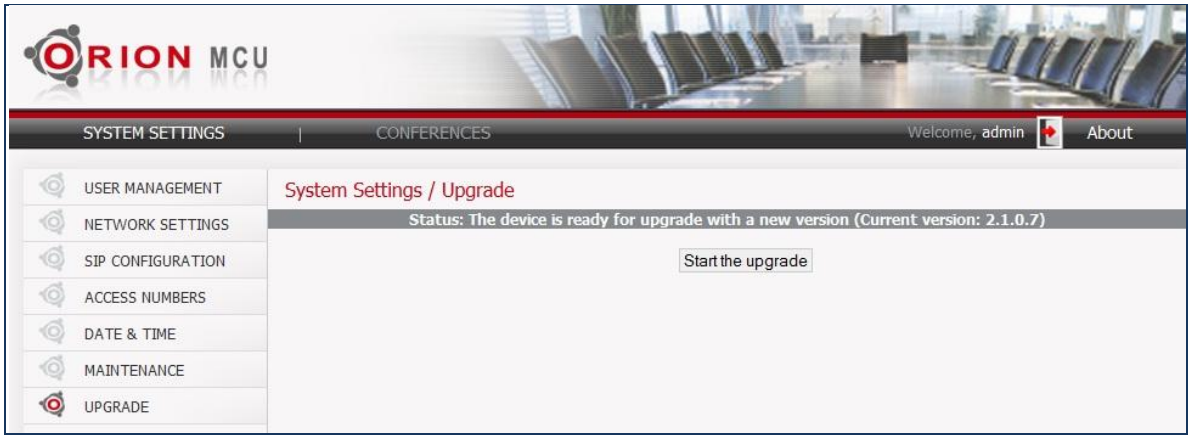


Figure 6-23: Starting the Upgrade Process

6. Click **Start the Upgrade**. The upgrade starts.

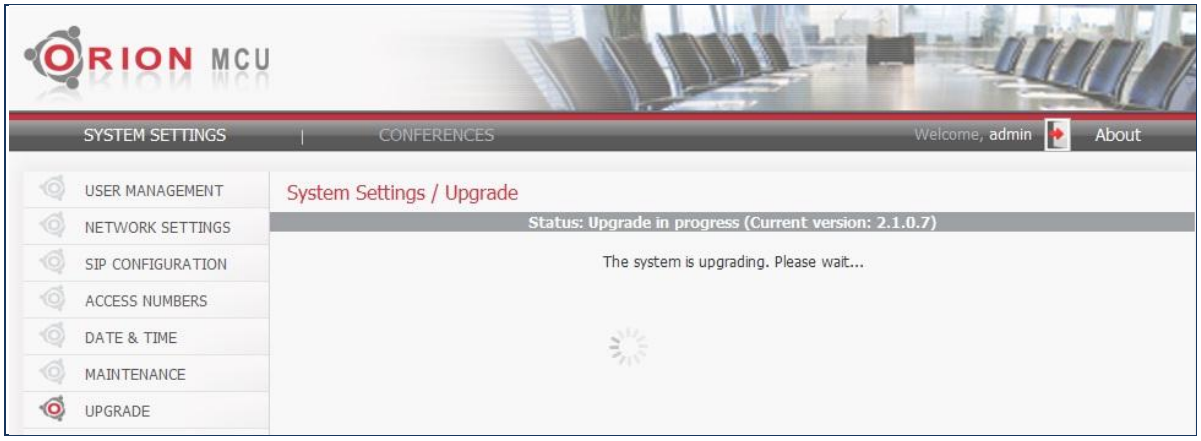


Figure 6-24: Upgrade Starting

7. Did you select the **Reboot** option before the software download?
   - If YES, then the system reboots automatically.
   - If NO, then click the **Reboot** button which appears after the upgrade is complete.

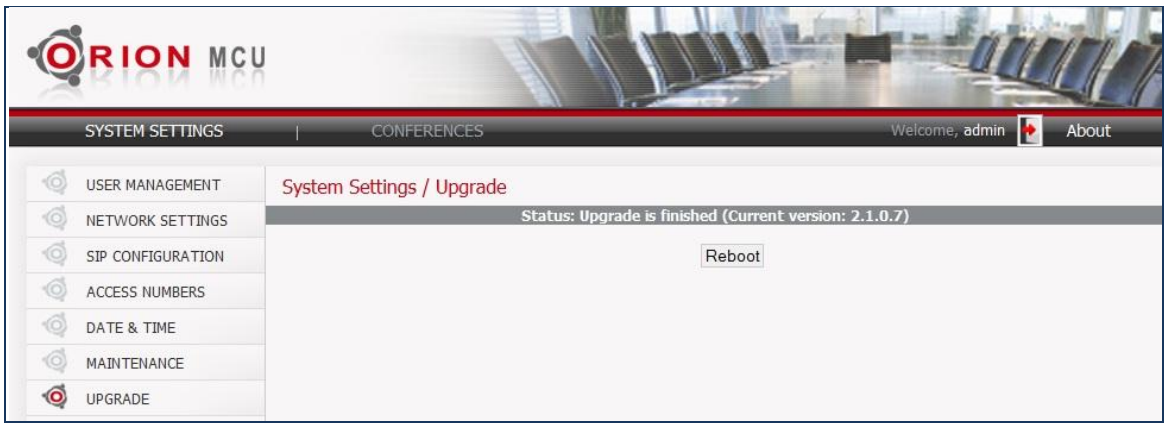


Figure 6-25: Reboot Confirmation

7. Conferences

After system parameters have been provisioned, conferences can be set up.

7.1 Summary

Select **Conferences > Summary** to view the list of the existing active conferences:

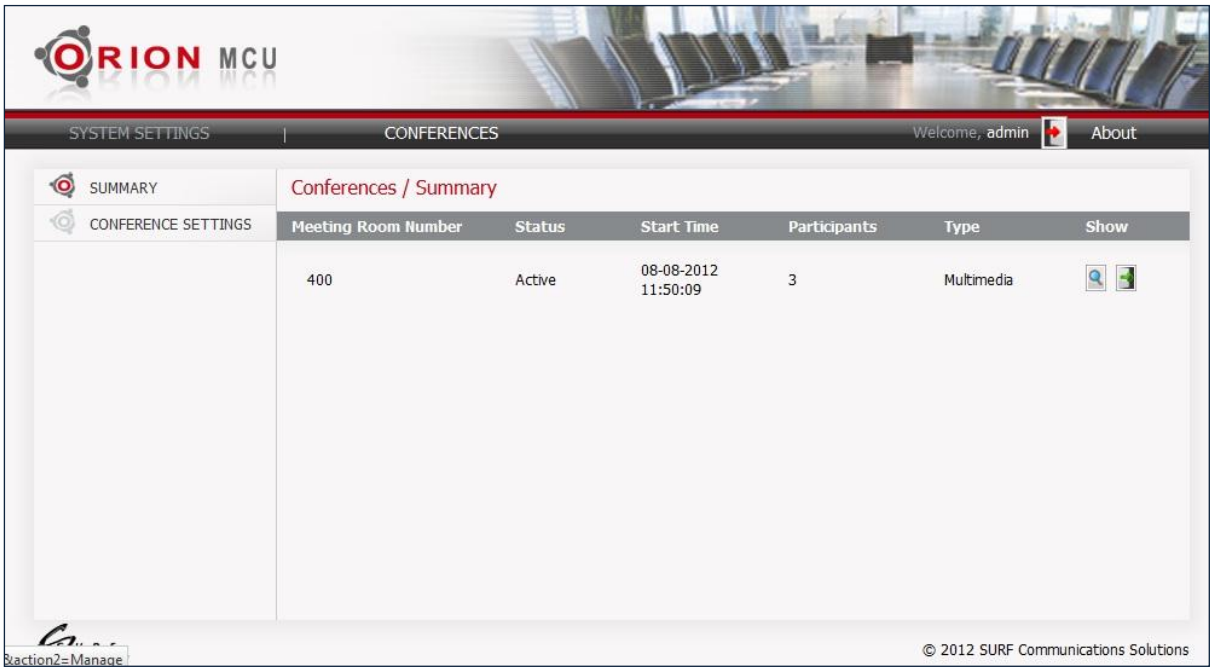


Figure 7-1: Conferences List

To see the details of a conference:

- Click **View** .

  Figure 7-2 details the selected conference information, including state, type and the list of participants including: telephone number, login time and role.

Figure 7-2: Conference Details

Click **Leader Dashboard**, to open the Leader Dashboard (section 88 below), and manage a conference.

7.2 Conference Settings

The parameters of an existing conference can be viewed or modified and new conferences can be created.

7.2.1 Opening the Conference Settings Window

To open the Conference Settings window:

- Select **Conferences > Conference Settings**.

  The list of the existing conferences is displayed :

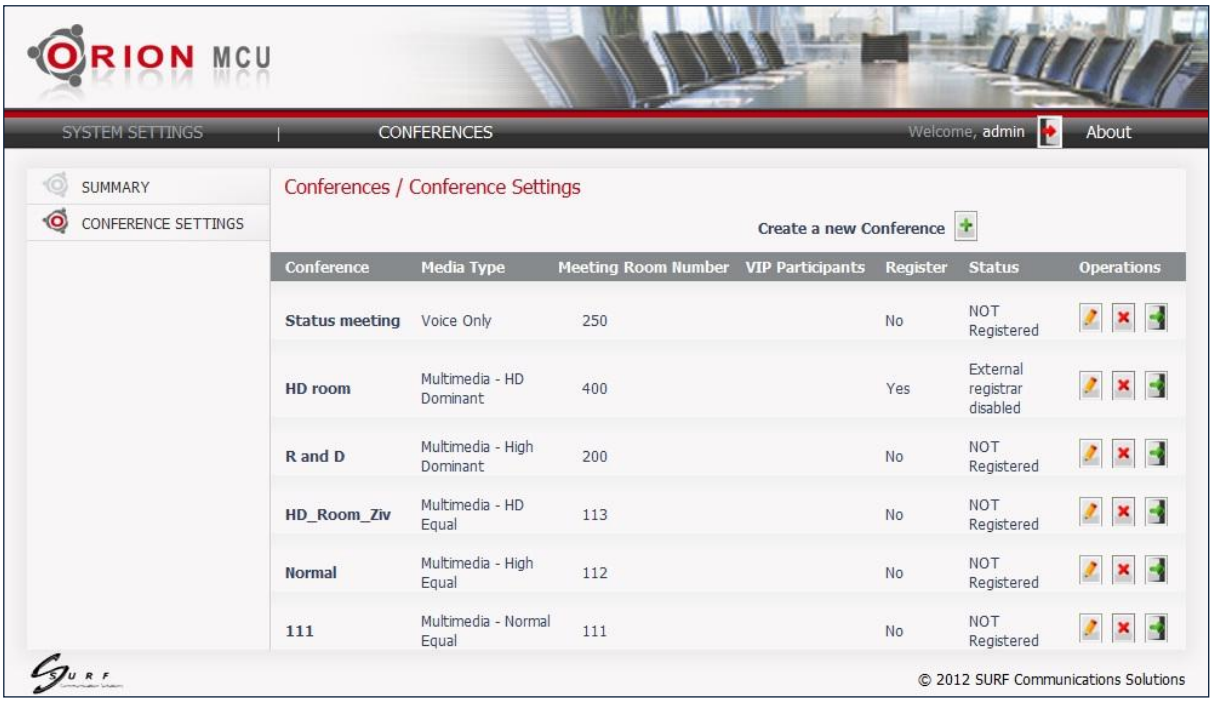


Figure 7-3: Conference Management

Note: The three parameters displayed in the **Media Type** column are as follows:

- Multimedia/Voice
- Video Quality: Normal: Voice Only, CIF (352X288) / High: VGA (640x480) / HD: (1280x720)
- Dominant Based/Equal Presence

7.2.2 Creating a Conference

To create a new conference:

1. Click **Create a new Conference** .

   The **Create a new Conference** window opens.

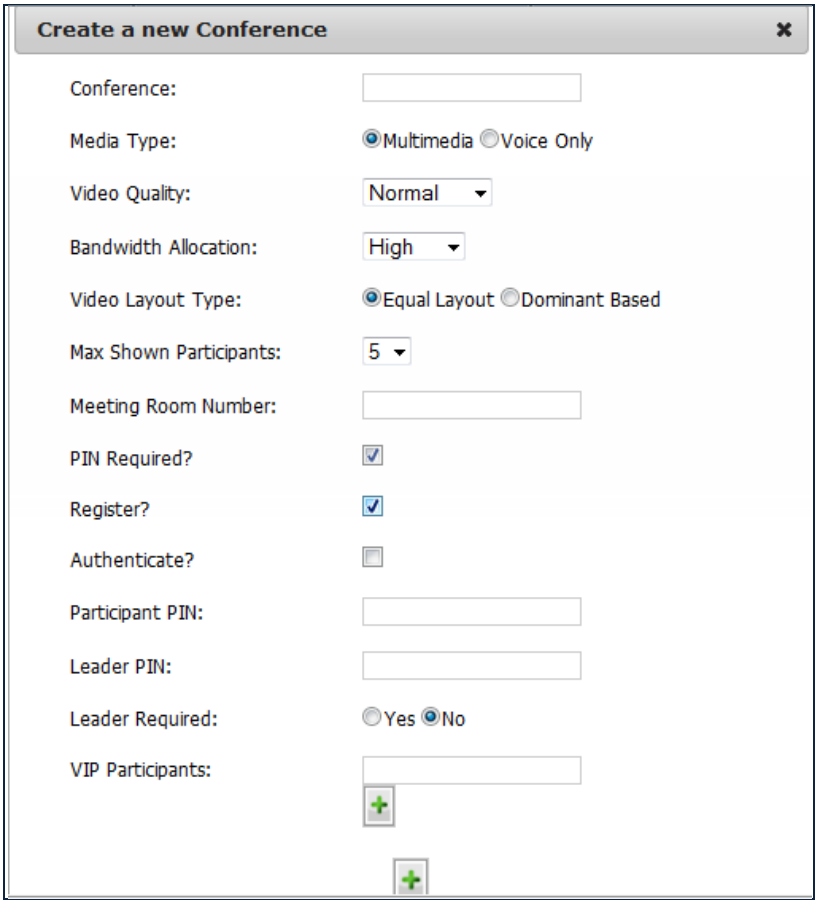


Figure 7-4: New Conference Details

2. Select conference parameters as described in section 7.3, Conferencing Parameters.
3. Click **Save** , to save the entered information.

7.2.3 Other Conference Actions

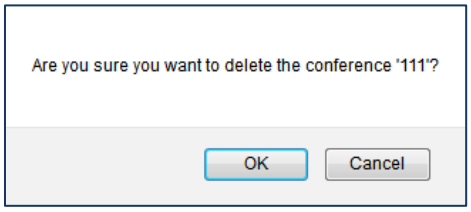
You can edit conferences, delete conferences, and open the **Leader Dashboard** to manage a conference from the **Operations** column of the **Conference Settings** window.

To edit a conference:

- Click **Edit** . Then edit conference parameters as described in Conferencing Parameters.

To delete a conference:

- Click **Delete** .



To manage a conference:

- Click **Leader Dashboard** , to open the **Leader Dashboard**. See section 8 Leader Dashboard.

7.3 Conferencing Parameters

Conferencing parameters are listed in the below table:

Parameter	Values	Remarks
Conference Name	String	The nickname of the conference
Media Type	Multimedia Voice Only	The type of conference to be defined, Multimedia for Video conference or Voice only for Voice conference.
Video Quality	Normal High HD Voice Only	The video quality of the conference Normal: CIF (352X288), High: VGA (640x480), HD: (1280x720), and Voice Only
Bandwidth Allocation	Low Medium High	SURF recommends using “Medium” as a default value, hence every new conference room’s “Bandwidth Allocation” parameter will be configured as “Medium”. If the bandwidth in the LAN or WAN, where the Orion-MCU in deployed, is low, please set the conference room’s “Bandwidth Allocation” parameter to “Low”. If there are no bandwidth restrictions, you may use “High” for enhanced video quality.
Video Layout Type	Equal Layout Dominant Based	The type of the video conference layout.

Parameter	Values	Remarks
Max Shown Participants	Number	Up to 16 shown participants for equal based layout or up to 8 shown participants for dominant based layout.
Meeting Room Number	Number	The meeting room (conference) can be accessed by direct dialing, if it is registered. Also used as username for the leader dashboard login.
PIN Required?	Yes/No	If positive, the participant is required to enter PIN number to log into the conference.
Register?	Yes/No	If positive then the conference is registered to the external registrar.
Authenticate?	Yes/No	If positive then the conference is registered with authentication.
Username	String	If authentication chosen, a username needs to be entered.
Password	String	If authentication chosen, password needs to be entered.
Participant PIN	Number	The participant PIN for logging into the conference
Leader PIN	Number	The conference leader PIN (should be different from the participant PIN). Also used as password for the leader dashboard login.
Leader Required	Yes/No	Defines if the conference can start before the leader joins the conference or not, if configured yes all regular participant will be placed on hold until the leader joins to the conference.
VIP Participants	List of numbers	Participants' phone numbers or SIP URIs who can join the conference without entering a participant PIN codes.

Table 7-1: Conferencing Parameters

7.4 Content Sharing

SIP clients may originate content sharing at any time during a conference session. In this case the conference layout is modified to one large image, which contains the content.

When the presentation is finalized, the system returns to the original layout.

Currently, content sharing works only with AVer Room system. To start the content sharing, the user should press the **Present** button on AVer's remote control or share his screen using AVer ScreenShare software.

7.5 Dialing Options

In order to join a conference from a video room system, phone or a softclient, the user can use the access number or the conference number. The following tables show various dialing options per each choice, using the below numbers:

- Access Number – 500
- Conference Number – 100
- Participant PIN Code – 1
- Orion-MCU Domain – Orion.com (Domain name or IP address).

Participant is registered on PBX:

Dialing Option	PIN Code	Operations and Prompts
Access Number	√	Dial 500 – Prompt: *"Please enter your conference number followed by the # key"* Dial 100 – Prompt: *"Please enter the conference PIN number followed by the # key"* Dial 1 – Connected to conference
Conference Number	√	Dial 100 – Prompt *"Please enter the conference PIN number followed by the # key"* Dial 1 – Connected to conference
Access Number		Dial 500 – Prompt *"Please enter your conference number followed by the # key"* Dial 100 – Connected to conference
Conference Number		Dial 100 – Connected to conference

Table 7-2: Dialing Information - Registered on PBX

Participant is registered on Orion-MCU SIP Build-in Registrar:

Dialing Option	PIN Code	Operations and Prompts
Access Number	√	Dial 500 – Prompt "*Please enter your conference number followed by the # key*" Dial 100 – Prompt "*Please enter the conference PIN number followed by the # key*" Dial 1 – Connected to conference **Alternative option (Connecting without prompts):** Dial 500*100*1 – Connected to conference
Conference Number	√	Dial 100 – Prompt "*Please enter the conference PIN number followed by the # key*" Dial 1 – Connected to conference
Access Number		Dial 500 – Prompt "*Please enter your conference number followed by the # key*" Dial 100 – Connected to conference
Conference Number		Dial 100 – Connected to conference

Table 7-3: Dialing Information - Registered on Orion-MCU

Participant is not registered:

Dialing Option	PIN Code	Operations and Prompts
Access Number	√	Dial 500@Orion.com – Prompt "*Please enter your conference number followed by the # key*" Dial 100 – Prompt "*Please enter the conference PIN number followed by the # key*" Dial 1 – Connected to conference **Alternative option (Connecting without prompts):** Dial 500*100*1@Orion.com – Connected to conference
Conference Number	√	Dial 100@Orion.com – Prompt "*Please enter the conference PIN number followed by the # key*" Dial 1 – Connected to conference
Access Number		Dial 500@Orion.com – Prompt "*Please enter your conference number followed by the # key*" Dial 100 – Connected to conference
Conference Number		Dial 100@Orion.com – Connected to conference

Table 7-4: Dialing Information - Not Registered

8. Leader Dashboard

8.1 Leader's Capabilities

The Leader Dashboard provides the following capabilities to the conference leader:

- Invite participants to join the conference
- Modify the status of the participant from dominant to non dominant and vice versa
- Make a participant visible/invisible
- Obtain call statistics
- Mute/Unmute all participants
- View detailed conference parameters
- Remove participants from the conference
- Modify the conference layout mode.

8.2 Leader Login

The leader logs into the Leader Dashboard by using the conference number as username and the leader PIN code as password, as shown below in Figure 8-1:

Figure 8-1: Leader Login

8.3 Main Screen

Figure 8-2 below shows the **Leader Dashboard**'s main window:

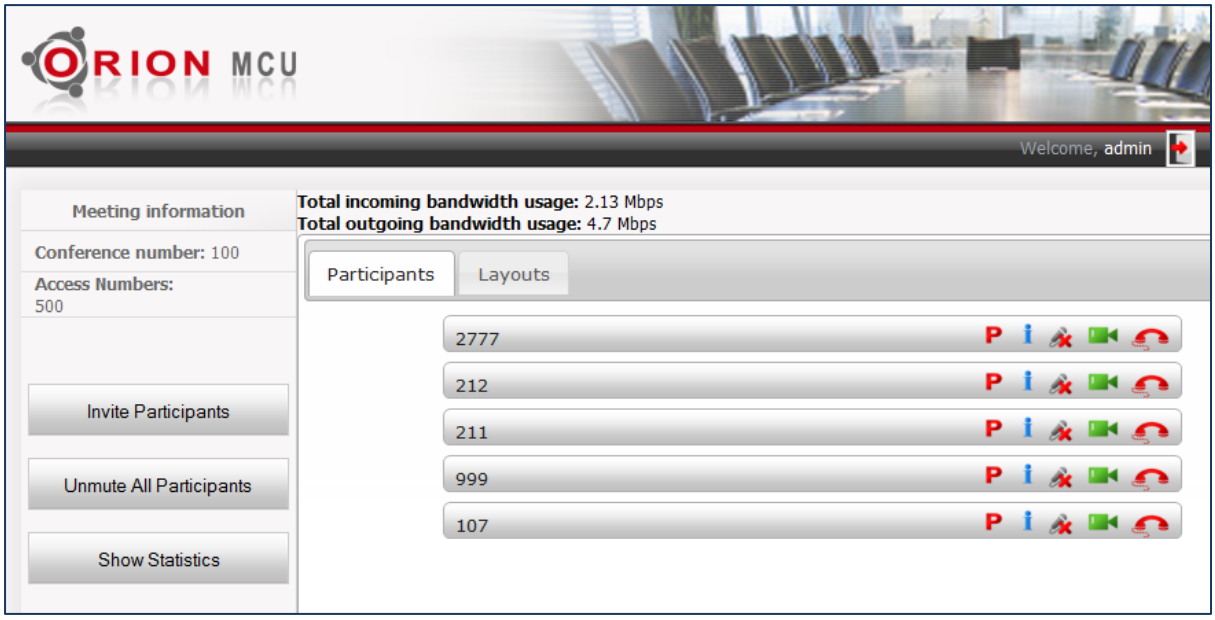


Figure 8-2: Leader Dashboard Main Window

On the main screen of the leader dashboard, the following items are displayed:

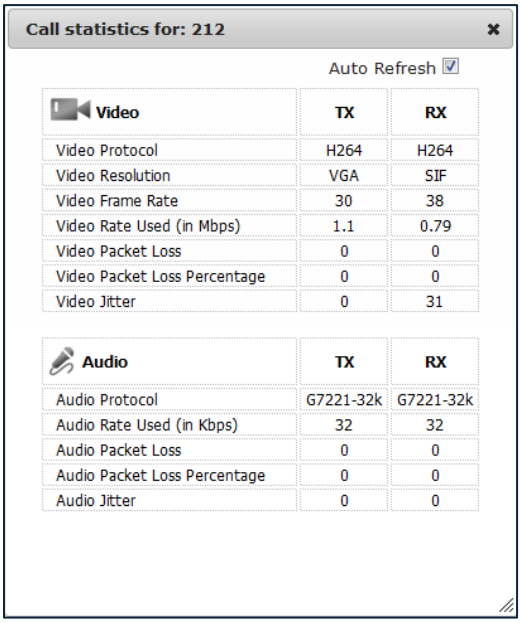
- **Meeting Information** – Meeting information includes conference and access numbers.
- **Total Bandwidth** - Total bandwidth usage of incoming and outgoing sessions, updated every 5 seconds - displayed at the top of the toolbar.
- **Operational Buttons –** The following operational buttons appear at the left side of the Leader Dashboard window:
  - **Invite Participants** – Enables the leader to invite participants to join the conference.
  - **Mute/Unmute All Participants**
  - **Show Statistics** – Displays the conference's detailed statistics information (section 8.5 below).
- Toolbar which includes **Participants** and **Layout** options (section 8). **Participants** screen provides the default display of the main screen.
- The list of the conference participants followed by icons - Each participant in the list is followed by icons. Each icon represents an information about the participant's state or /and enables the user to toggle between the states, by clicking on it.

The icons and the state they represent are listed in Figure 8-3 below:

Dominant participant	**Participant (not Dominant)**	
Call statistics		
Participant voice enabled	**Video only conference**	**Participant voice muted**
Visible, participant	**Voice only participant**	**Participant video disabled**
Remove participant		

Figure 8-3: Leader Dashboard Icons

Figure 8-4 shows a participant's call statistics information, appears upon clicking on :



Call statistics for: 212

Auto Refresh

Video	TX	RX
Video Protocol	H264	H264
Video Resolution	VGA	SIF
Video Frame Rate	30	38
Video Rate Used (in Mbps)	1.1	0.79
Video Packet Loss	0	0
Video Packet Loss Percentage	0	0
Video Jitter	0	31

Audio	TX	RX
Audio Protocol	G7221-32k	G7221-32k
Audio Rate Used (in Kbps)	32	32
Audio Packet Loss	0	0
Audio Packet Loss Percentage	0	0
Audio Jitter	0	0

Figure 8-4: Call Statistics

8.4 Layouts

To set the conference layout mode, click the **Layouts** tab on the main leader dashboard screen. Figure 8-5, shows the current and the possible layouts:

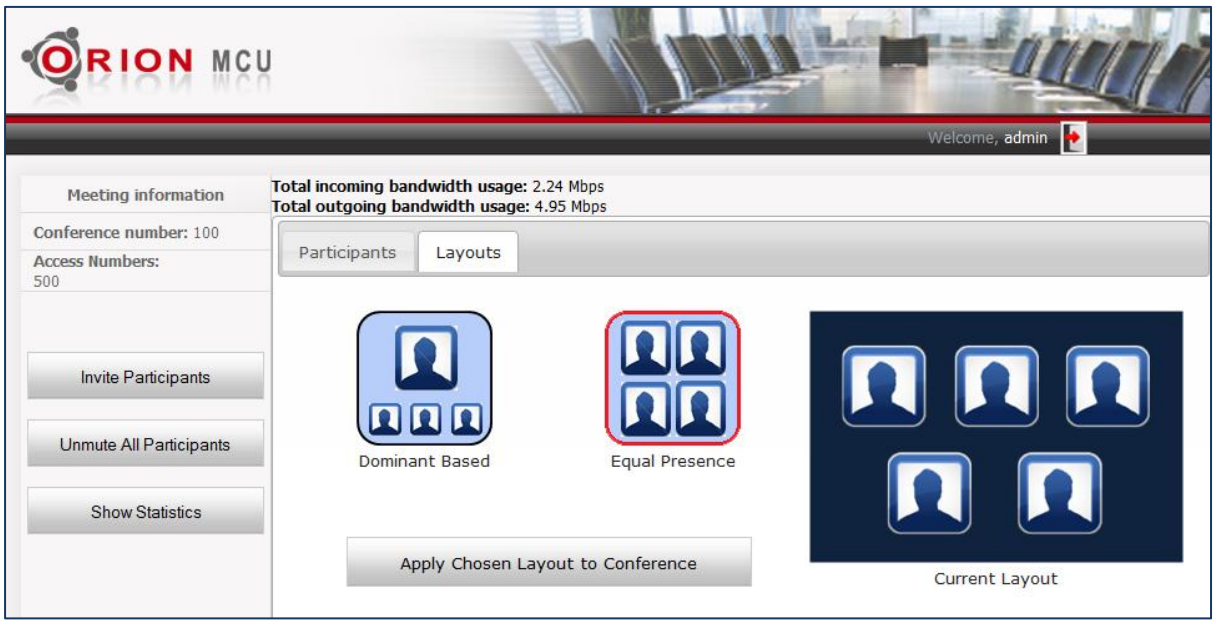


Figure 8-5: Conference Layouts

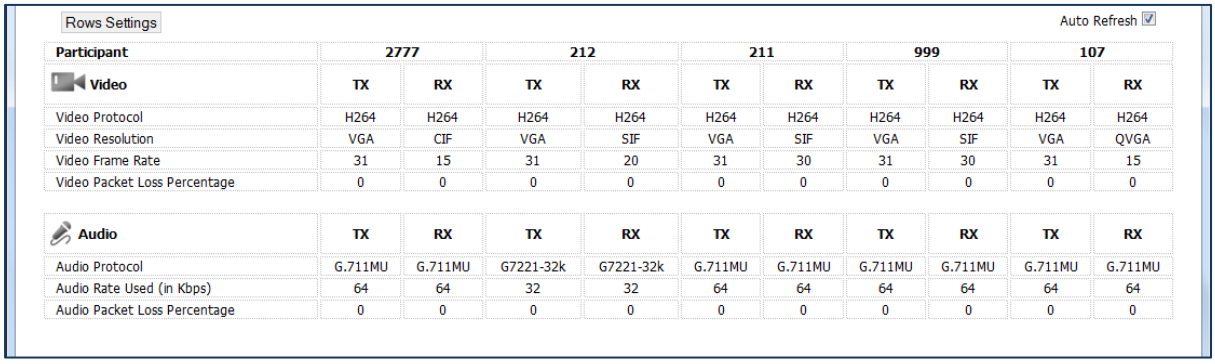
One of two layouts can be chosen:

- **Dominant based**: The dominant speaker's image is larger than the other participants' images (The dominant speaker is automatically defined by energetic voice detection).
- **Equal Presence**: All the images are displayed equally.

The red border shows the chosen layout. Click **Apply Chosen Layout to Conference** to select a layout.

8.5 Show Statistics

To view the conference statistics details, click the **Show Statistics** button on the left side of the leader dashboard screen. Figure 8-6 showing the statistics information of all the conference participants:



Rows Settings | Auto Refresh ☑

Participant	2777		212		211		999		107	
Video	**TX**	**RX**	**TX**	**RX**	**TX**	**RX**	**TX**	**RX**	**TX**	**RX**
Video Protocol	H264	H264	H264	H264	H264	H264	H264	H264	H264	H264
Video Resolution	VGA	CIF	VGA	SIF	VGA	SIF	VGA	SIF	VGA	QVGA
Video Frame Rate	31	15	31	20	31	30	31	30	31	15
Video Packet Loss Percentage	0	0	0	0	0	0	0	0	0	0
Audio	**TX**	**RX**	**TX**	**RX**	**TX**	**RX**	**TX**	**RX**	**TX**	**RX**
Audio Protocol	G.711MU	G.711MU	G7221-32k	G7221-32k	G.711MU	G.711MU	G.711MU	G.711MU	G.711MU	G.711MU
Audio Rate Used (in Kbps)	64	64	32	32	64	64	64	64	64	64
Audio Packet Loss Percentage	0	0	0	0	0	0	0	0	0	0

Figure 8-6: Conference Statistics

Use the horizontal scroll bar to view all the participan's information.

Set the **Auto Refresh** check-box to update the displayed information automatically. The information is updated every 5 seconds.

The rows in the statistics table above can be set or reset by clicking on the **Rows Settings** button. As shows in Figure 8-7:

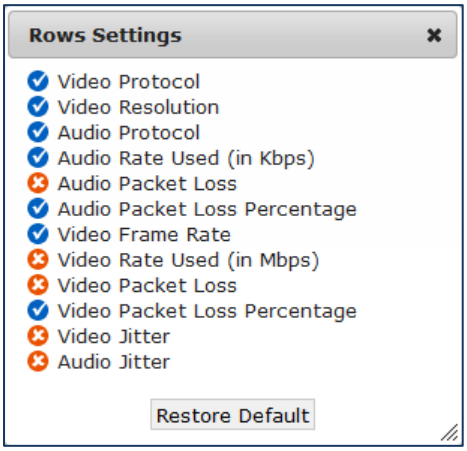


Figure 8-7: Rows Settings

Click on **Restore Default** to restore the original rows settings.

8.6 Invite Participants

To invite participants to join a conference:

1. Click the **Invite Participants** button.

   The **Invite Participants** window opens as shows in Figure 8-8:

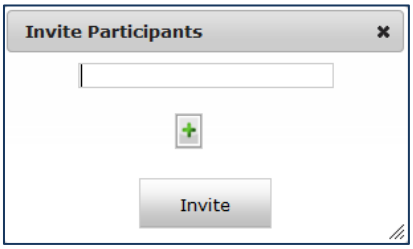
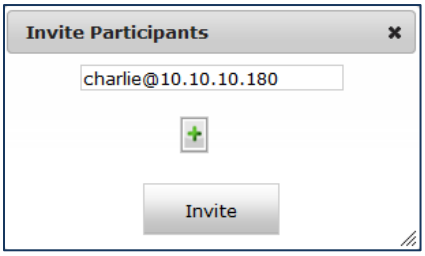


Figure 8-8: Inviting Participants

2. You can enter one of the following:

   a) **For registered participant**: Enter the name/number appears in the registration to SIP registrar

   b) **For non-registered participant**: Enter the full path including the SIP server IP address: name/number@SIP server-IP-Address



3. Click to add more participants and then click **Invite**.

9. Firewall and NAT

9.1 Overview

Orion-MCU provides voice and video conferencing services for SMBs and enterprises, and is naturally located either in a demilitarized zone (DMZ) with a public or private IP address or in a LAN behind the organization's Firewall/NAT (Network Address Translation) with a private IP address. The Orion-MCU may also reside in a public IP.

Firewalls that are not SIP aware may cause complexity in providing connectivity with clients, located in the external IP network or behind other firewalls.

This section describes the possible topologies, firewall/NAT settings, and NAT traversal in Orion-MCU.

9.2 Topologies

9.2.1 Orion-MCU in a DMZ

When Orion-MCU is located in the DMZ, it allows you to assign to it a public or private IP address. This enables an easy access and direct connectivity with video clients in the public internet as shown below in Figure 9-1:

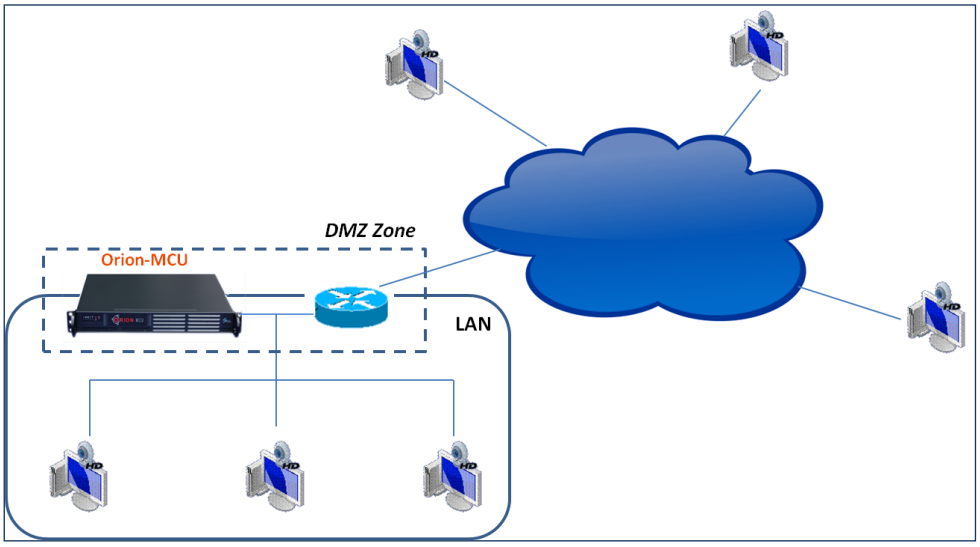


Figure 9-1: Orion-MCU in DMZ Zone

9.2.2 Orion-MCU behind a NAT

When Orion-MCU system is located behind a NAT, in a private LAN, it is not accessed directly by the other entities in the internet. This causes a better security on one hand and on the other hand it makes the connectivity with outside world more complicated. When deploying the Orion-MCU in this topology, it is required to provide port mapping to the Orion-MCU. As shown below in Figure 9-2:

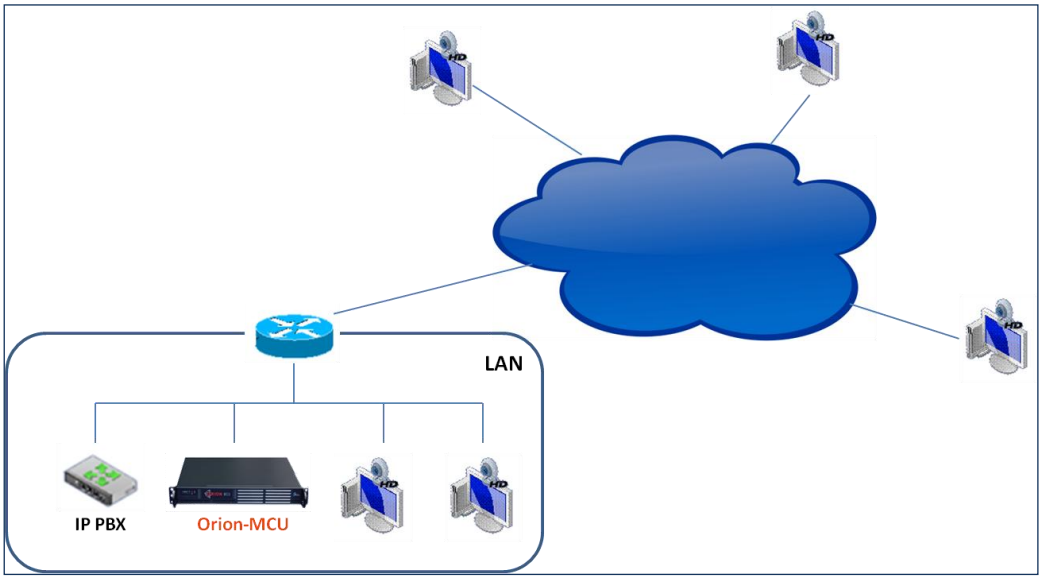


Figure 9-2: Orion-MCU Located in LAN

9.3 Firewall/NAT Settings

In order to use a firewall/NAT, it is recommended to follow the below settings:

9.3.1 Blocking Ports

Block the access, from the external IP network, to the following ports:

- 22 (ssh)
- 23 (telnet)
- 80 (http)
- 443 (https)

You may let them remain open for internal administrative operations.

9.3.2 Enabling SIP Sessions

To enable SIP setup with other entities in the external network, the firewall/NAT router must be configured to allow incoming and outgoing SIP messages through UDP port 5060 and 5093 (for SIP session signaling) and TCP port 5061 (for TLS).

9.3.3 RTP Traffic Ports Range

The range of the UDP ports for the incoming and outgoing RTP packets need to remain open in the firewall/NAT. Orion-MCU communicates through ports in the range 10000-20000, for video, voice and content sharing.

The actual range can be restricted within the default one, depending on number of conferences, participants per conference, conference type and Orion-MCU's model you are using.

9.4 NAT Traversal in Orion-MCU

9.4.1 Near-End NAT Traversal

In a deployment scenario where Orion-MCU is located behind a firewall and is configured with private IP address, the signaling sent from the Orion-MCU messeges will contain private IP addresses. Unless the firewall provides VoIP NAT Traversal services, sessions will not connect, as the singling messeges will contain non-routable addresses. This issue is called Near-End NAT traversal, as the problem to be solved is "near" – meaning the close firewall.

Orion-MCU solves this problem by providing near-end NAT traversal as part of the Orion-MCU. The private IP addresses within the SDP are replaced by the NAT's public IP address and the clients receive SIP messages which include SDP with accessible public IP addresses, providing session completion.

9.4.2 Orion-MCU Setting for Near-End NAT Traversal

In order to allow near-end NAT Traversal in Orion-MCU, follow the below steps:

1. Select **System Settings > SIP Configuration**. The below screen opens:

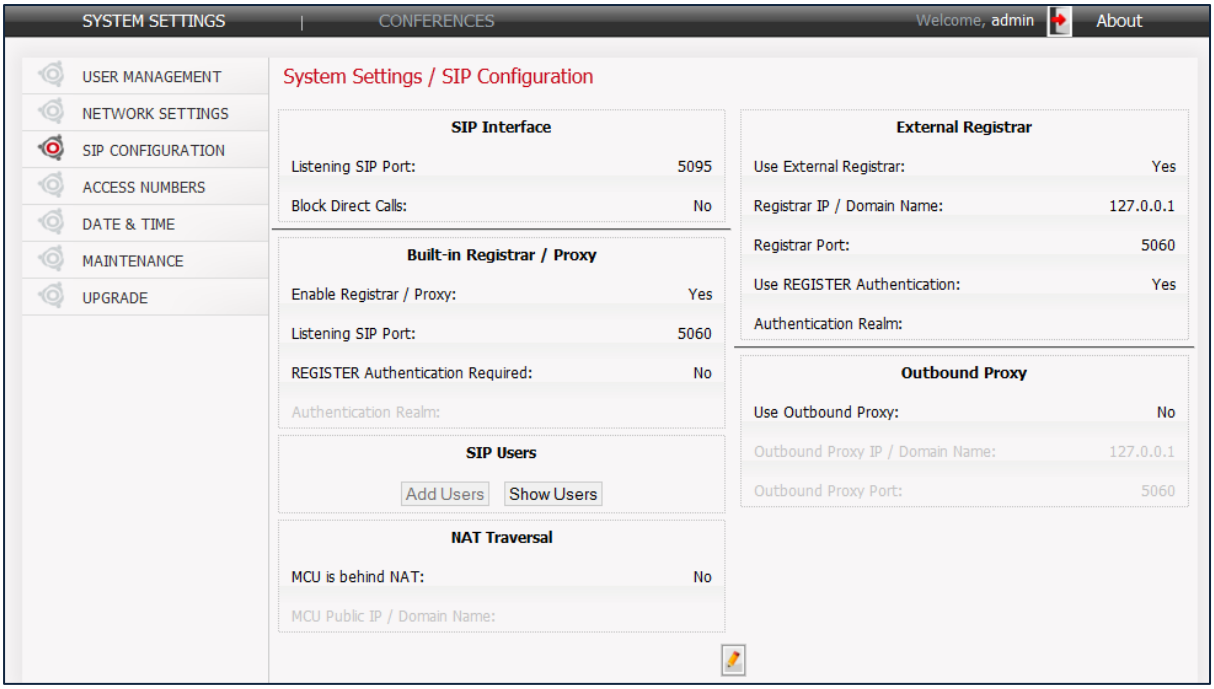
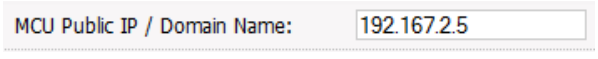
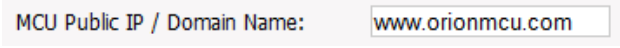


Figure 9-3: SIP Public IP Configuration

2. Click **Edit** . SIP settings become editable.
3. Check the **Enable Registrar / Proxy** check-box.
4. Enter a value for **Listening SIP Port.**
5. Check the **MCU is behind NAT** check-box.
6. Enter a value for **MCU Public IP / Domain Name**:



or



7. Press **Save** to save the configuration.
8. The system restarts. If **Domain Name** has been entered, the address is resolved.
9. Near-end NAT traversal is applied.

9.4.3 Far-End NAT Traversal

When the SIP client is behind a firewall, Orion-MCU may receive private IP addresses in the received SDP (for sending the session's RTP packets) as shown below in Figure 9-4:

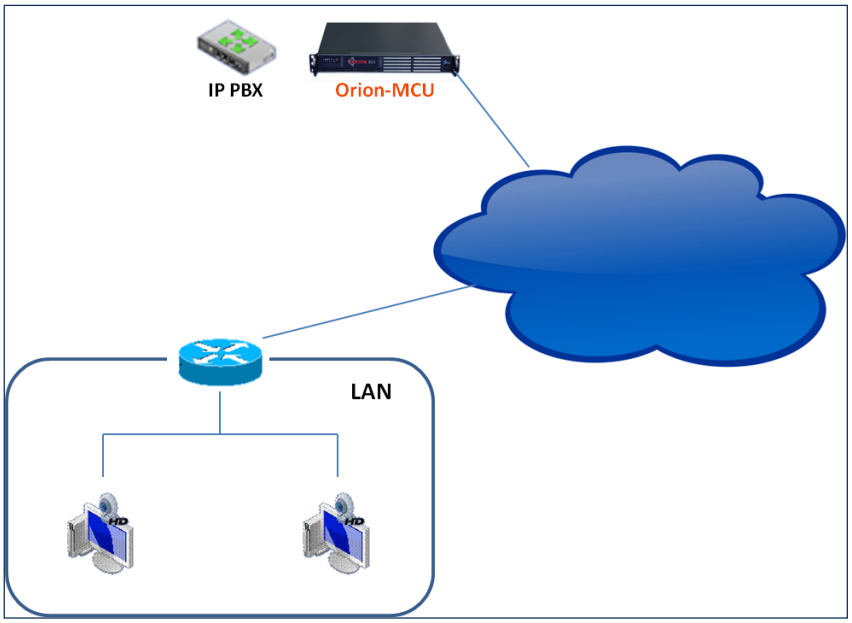


Figure 9-4: SIP Client behind a NAT

In this case, the packets cannot be sent, until the first packets are received from the client. The system learns the actual public IP address of these packets, and sends the transmitted RTP packets to this address.

Far-end NAT traversal is applied automatically and no setting is needed in Orion-MCU.

Note: Please note that in order for this topology to work, the SIP clients located behind the local firewall must support Near-End NAT traversal.

Near End NAT Traversal for SIP Clients requires the SIP clients to send their routable (in most cases Public) IP address in their contact information and r-port parameter.

10. Serial Connectivity

If there is no communication with the system for any reason, the Orion-MCU can be accessed by the serial I/O port for a basic troubleshooting. Follow these steps to enable serial communication.

Step 1: Physical Connectivity

Connect the serial port of your laptop to the Orion-MCU serial port. If no serial I/O port is available on your computer, use a USB adaptor.

Step 2: Login

Use any Telnet software, for example "PuTTy", Enter the relevant input as shown in the **PuTTY Configuration** display below and press **Open**:

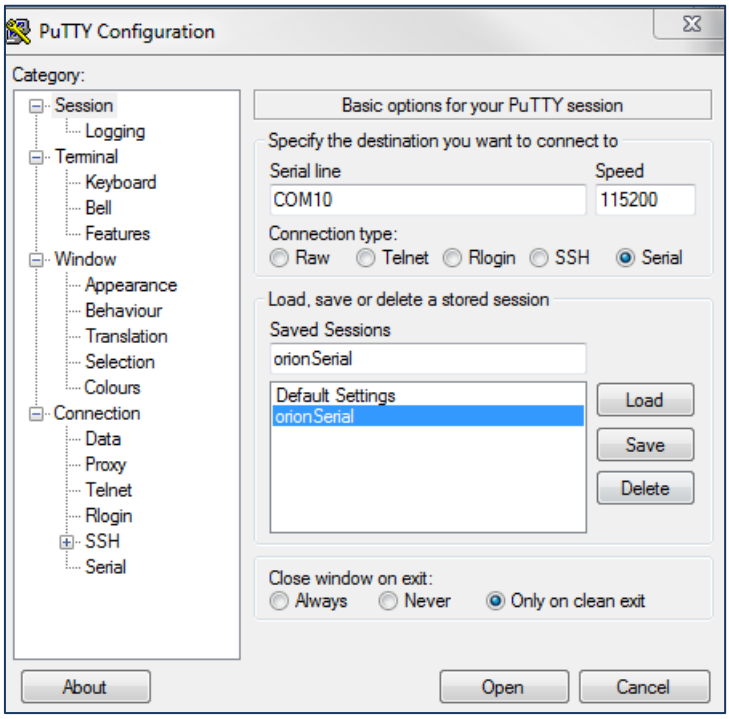


Figure 10-1: System Login

Step 3: Emergency menu

Enter the default user name and password (admin, admin) to view the emergency menu. Use the arrow keys and <Enter> to make your selection from the following options:

1. Show the IP address of the system
2. Set a default IP address
3. Reset the password
4. Reboot the system
5. Logout

11. Appendix-A: Precautions & Safety

11.1 Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In a single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extracting a component from the rack.
- Extract only one component at a time - extracting two or more simultaneously may cause the rack to become unstable.

11.2 Server Precautions

- Review the electrical and general safety precautions.
- Determine the placement of each component in the rack before you install the rails.
- Install the heaviest server components at the bottom of the rack first, and then work up.
- Use a regulating, uninterruptible power supply (UPS) to protect the Orion-MCU from power surges, voltage spikes and to keep your system operating in case of a power failure.
- To maintain proper cooling, always keep the rack's front door and all panels and components on the components closed when not servicing.

11.3 System Safety

11.3.1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the Orion-MCU from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components. When disconnecting power, you should first shut down the system and then unplug the power cords.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

11.3.2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the system clean and free of clutter.
- The system weighs approximately 10 lbs (4.5 kg).
- Place the chassis top cover and any system components that have been removed, away from the system or on a table so that they won't accidentally be stepped on.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws, after ensuring that all connections have been made.

12. Appendix-B- Rack Mounting

The box your chassis was shipped in should include four mounting screws, which you will need if you intend to install the system into a rack.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease of servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment room, service closet, etc.).

Rack Mounting Considerations

Ambient Operating Temperature: If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow: Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading: Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading: Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on over current protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground: A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

Rack Mounting Instructions

This section provides information about installing the Orion-MCU into a rack unit. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Installing the Chassis into a Rack:

1. Confirm that chassis includes the four mounting screws required to mount the chassis into a rack
2. Align the thru holes of the chassis with the thru holes of the rack.
3. Insert the mounting screws into the thru holes in the front of the chassis and through the thru holes in the rack

Installing into a Telco Rack

The compact design of the Orion-MCU enables installation into a Telco rack without the use of rails. The installation instructions are similar to the regular rack instructions.

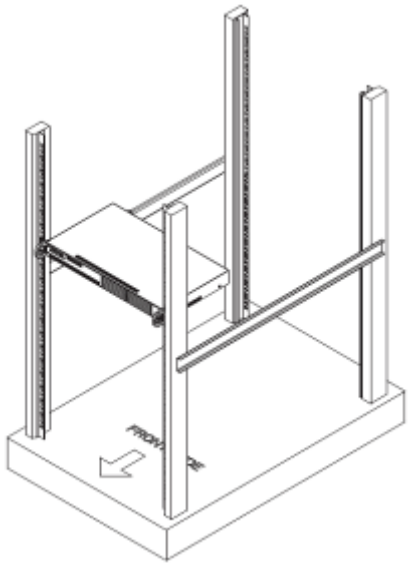


Figure 12-1- Installing Orion-MCU into a Rack

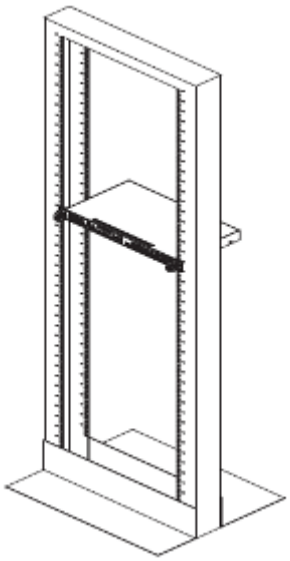


Figure 12-2- Installing Orion-MCU into a Telco Rack

13. Appendix C- Technical Specification

Dimensions: 9 x 7.5 in (229 x 191 mm)

Chassis: 1U Rackmountable

Weight: Gross Weight: 10 lbs. (4.5 kg.)

System Input Requirements

AC Input Voltage: 100-240 VAC (auto-range)

Rated Input Current: 3A max.

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 200W (Part# PWS-202-1H)

Rated Output Voltages: +3.3V (8A), +5V (8A), +12V (16A), -12V (0.5A), +5Vsb (2A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)

Non-operating Temperature: -40º to 70º C (-40º to 158º F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-operating Relative Humidity: 5 to 95% (non-condensing)

Web-based GUI

Orion-MCU web based GUI supports Internet Explorer 8 or newer, Google Chrome 20 or newer, Mozilla Firefox 14 or newer and Safari 5 or newer.

End of Document